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Colorado State Agricultural College



Class in Dairying.

Annual Announcement

Practical Courses in Agriculture, Domestic Science and
Horse Shoeing

Published by THE STATE AGRICULTURAL COLLEGE
FORT COLLINS, COLORADO

Agriculture and Domestic Science

Officers and Instructors

PRESIDENT OF THE COLLEGE.

THE DEAN OF AGRICULTURE.

THE DEAN OF WOMEN.

Prof. W. L. Carlyle	
.....	Animal Breeding, Care and Management of Live Stock
Prof. G. H. Glover.....	
.....	Veterinary Science, Animal Diseases, Bacteriology
Prof. W. P. Headden	Agricultural Chemistry
Prof. C. P. Gillette.....	Entomology, Physiology, and Hygiene
Prof. W. H. Olin....	Farm Crops, Farm Management and Soil Fertility
Prof. L. F. Paull.....	Plant Life, Horticulture and Gardening
Prof. H. M. Cottrell.....	Feeds and Feeding
Prof. G. E. Morton.....	Breeds and Types of Live Stock
Prof. H. M. Bainer.....	Farm Machinery
*Prof. _____	Home Science
Prof. W. R. Thomas.....	Irrigation Law and Constitution
Prof. E. B. House.....	Principles of Irrigation
Prof. B. F. Coen.....	English
Prof. F. C. Alford.....	Chemistry
Prof. B. O. Longyear.....	Plant Life and Forestry
Prof. S. A. Johnson	Entomology
C. G. Dwyre.....	Instructor in Farm Bookkeeping and Accounts
Miss Lottie Crawford.....	Instructor in Cookery
Miss Rebecca Boswell.....	Instructor in Sewing
Fritz Knorr.....	Assistant in Agronomy
E. J. Iddings.....	Assistant in Animal Husbandry
Dr. H. E. Kingman.....	Assistant in Veterinary Science

*To be filled.

Announcement

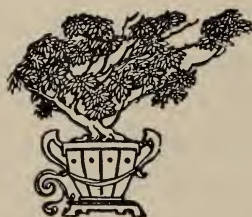


A practical course in Agriculture and Domestic Science is offered at this time to supply the demands of young men and women who are ambitious to excel in their life work along agricultural and domestic lines and who feel the need of a thoroughly practical and scientific education in their chosen calling. The time which such young people can devote to study in colleges is often limited, and the preparation necessary for a regular college course, in a great many instances, has not been acquired by the boys and girls on the farm. For these reasons the selection of topics and the arrangement of studies, laboratory work, live stock judging exercises, etc., have been planned to give the greatest amount of knowledge and training possible in the shortest time. The subjects chosen for the course are those about which every young man and woman associated with farm life should have definite and clear knowledge and training. In their discussion the subjects are treated in such a manner as to make the information obtained most helpful to the student.

There is no longer any question concerning the value of advanced practical and accurate knowledge bearing on successful agricultural practices to those who follow farming, stock raising and home making as a business. Education and training pay on the farm and in the home as they pay in any other callings in life. Experience has enabled us to plan buildings, secure instructors and apparatus, and arrange a course of study so intensely practical and helpful in its character that we believe the ambitious young men and women who carefully consider the matter presented in this circular will not debate whether they can afford to take the

course or not, but rather whether they can afford to miss the advantages presented by taking such a course. The expenses connected with the course are very small indeed when the advantages offered are considered, and any energetic young man or woman, no matter how limited in their resources, can secure the funds necessary to enable them to take the course. The students attend in the winter months when the farming work is least pressing usually, as the money necessary to meet the expenses of the session can be earned in a single year at farm labor by any ambitious young person.

The College of Agriculture is maintained in part by the State and in part by the United States Government. The fees paid by students constitute an exceedingly small portion of the total outlay. The special aim and object of the College of Agriculture is to build up in the State of Colorado the farming interests in all branches and to make those living on the farms more intelligent and useful citizens.



Course of Study

Live Stock Judging, Breeds of Live Stock, Animal Breeding and Feeding, Care and Management of Live Stock.

Professors Carlyle, Morton and Cottrell.

Assistants: E. J. Iddings, A. L. Hutchings and Jas. Hutton.

The course of study embraces a series of practical lectures to each class, besides a vast amount of practice work in the judging, feeding, care and management of live stock in the live stock classroom and stables; also a study of pedigrees of live stock. The lectures provided for the first-year students will treat largely of the origin, history, characteristics and utility of the various types and breeds of horses, cattle, sheep and swine. Special attention is given to the characteristics and utility of those breeds and types which have proven well adapted to existing Colorado conditions.

A large, well-lighted and well-equipped live stock classroom has recently been built for the accommodation of students in practical live stock subjects. This will prove very valuable in training the students in the selection and judging of live stock.

First-year students in stock judging exercises use score cards to acquire the necessary practice on typical animals to fix in their minds the value of a perfect development of the various parts or points of the animal. Through this practice in scoring animals supplemented by lectures bearing on the different qualifications of the various animals scored, the students secure the initial training necessary to fit them for judging animals in group competition later. The general plan of the first-year course is to thoroughly acquaint the student not only with the perfect types of the several breeds, but also the types of various market classes

of live stock as a preparation for the work of the second year, which naturally follows.



Judging Beef Cattle.

Attention is given to competitive or show ring judging. The classification of stock adopted by our leading fairs is followed as far as possible. A number of animals are led into the classroom and the students are directed to place them in their order of merit, writing out concisely their reasons for placing one animal ahead of another in competition.

The second-year lectures on breeding include the principles, methods and practices of breeding. This work is supplemented and brought home to the students by having them tabulate pedigrees from herd and flock books, which serves to illustrate graphically the lines of breeding followed in the evolution of some of the highest types in the various breeds of live stock. In discussing the principles of breeding, heredity, atavism, variation and allied topics are presented, while in considering the methods of breeding, such topics as in-breeding, line-breeding and balanced-breeding are discussed.

In the study of feeds and feeding, the students will receive instruction in the composition and value of the various feeding stuffs as found in plant and animal substances, and their relation to the growth, development and fattening of the various classes of live stock. Each of the different crops grown on the farms and ranches of Colorado will be discussed from the stockman's standpoint, and their weak and strong points noted. The importance of these subjects of successful farming or ranching will never be lost sight of in this course of study, since it forms the basis for continued prosperity in agricultural communities. Consequently great care is exercised in advancing the student's knowledge and in increasing his interest in everything relating to the improvement and welfare of the animals on the farms and ranches. The aim of this course in feeds and feeding is to so aid and instruct the student in the principles underlying the nutrition of farm animals that upon finishing his course he will be able to join the ranks of the most up-to-date stockmen of this state and to practice successfully the science of stock raising and feeding.

Second-year students will also be given practical instruction at the stables in the care and management of the different classes of stock; a certain number of students being required to work in the barns by turns, one or two hours each day. Each student is required to become proficient in taking the temperature, respiration and pulse of the various classes of live stock. They are also given valuable instruction in the care and nursing of sick animals, such as making and applying poultices, bandages, etc. Grooming, blanketing, fitting and trimming stock in a manner similar to that practiced by breeders when preparing for a show or sale is taught by experts in this line. The practical feeding and managing of dairy cows, sheep, swine and horses is demonstrated in the barns, each student being required to assist in such work. The aim in this course is to help the student become a thoroughly practical and expert stockman.

Farm Dairying

Professor Bainer.

Assistant: _____

The course in farm dairying includes both lectures and practice in this very important line of agricultural effort. Instruction in the feeding, care and management of dairy cattle, the production of milk, the testing of milk and the making of butter, will be discussed and practice work given. A large room is well equipped with all the latest machinery and facilities for this work. The apparatus includes the most modern hand cream separators now used on our farms, as well as the various testing machines, churns and utensils generally. The instruction includes lectures on the care of milk, its separation, the construction of separators and practice of putting them together and studying the different parts of each machine. A supply of milk will be provided and each student will be required to use the different separators and become familiar with the various manipulations which control the separation of cream from milk, the thoroughness of skimming, the regulation of thickness of cream, etc. The cream obtained from operating these separators is ripened and prepared for churning by the students, thorough instruction being given in all the details. The butter is churned and worked with apparatus that is most successfully used in farm dairy practice. Each student is required to go through the entire operation of butter making from the time the milk is received until the butter is ready for the consumer. In the course in milk testing, hand testers similar to those used by farmers are supplied. Students learn how to test milk and to overcome many of the difficulties experienced by farmers in testing. The entire course in dairying is given with the object of so training the students that they may be able to carry on all the operations of a farm dairy in the most up-to-date manner.

Veterinary Science

Dr. Glover.

Assistant: Dr. Kingman.

In this course students will be given practical instruction regarding the anatomy and the physiology of animals; also the nature, cause, symptoms, and treatment of the more common diseases, and the means by which they may, in many instances, be prevented. It will be the aim and object of the instruction to qualify each student to act as



Testing Cow for Tuberculosis.

an intelligent, capable nurse of ailing animals and to be able to recognize diseases and to give simple and efficient treatment of ordinary accidents and diseases. During the course, demonstrations will be given from living and dead animals, simple operations will be indicated, method employed in detecting diseases and in choosing, compounding and administering medicines will be taught. Full instructions will be given in the examination of horses for sound-

ness and students will be required to pass upon soundness of subjects selected for the purpose.

The information acquired in this course will prove of great value in the breeding, feeding and general management of farm animals and an excellent preparation for those who later intend to enter a veterinary college. As aids to the work, the College has skeletons of the horse, cow and other domestic animals and a valuable collection of modern veterinary instruments, casting apparatus, drugs, etc. Instruction in this course is given to both first and second year students.

Soils, Field Crops and Farm Management

Professor Olin.

Assistant: Mr. Knorr.

This course consists of lectures and laboratory research work upon the kinds of soils, texture, improvement and tillage methods advisable for the various crop regions of Colorado.

The "Thorough Tillage" method of soil culture will be fully explained. Soil culture is the foundation of all crop farming.

The study of Field Crops will include methods of propagation, germination, plant growth, improvements of plants, and a special study of crops adapted to Colorado soils and climate.

Our altitude and methods of irrigation make the selection of particular crops adapted to our conditions an essential factor to our success.

We will make a study of crops according to the following division:

1. Crop regions below 6,000 feet elevation, under irrigation.
2. Crop regions above 6,000 feet elevation.
3. Crop and grazing regions below 6,000 feet elevation without irrigation.

Certain types of grain show good quality and satisfactory yields when grown on the mountain mesas in higher altitudes. Here, also, certain root and forage crops show

remarkable adaptability. The crops on our plains at lower altitudes have different conditions and changed environment, hence different varieties of the same crops are required.



Class Inspecting Winter Wheat.

The crop conditions in one section differ so materially from those in another section of the state that we must carefully study the essential qualities of the various field crops in order to choose those best adapted to local conditions and needs.

Methods for improvement of our crops, special crops adapted to particular regions of Colorado, and facts to aid in making desirable crops more productive, will be brought out in discussion and class lectures.

Our aim shall be in this study to help the farm student as far as possible, to obtain desirable quality and satisfactory yield on all the crops grown on the home farm.

The conditions are so dissimilar in passing from the mountain ranch to the ranch on the plains, the intensely cultivated farm in an irrigated region to the "dry farming" now being carried on in many sections of Colorado, that it

seems important for the farm student, just taking up his work, to know the conditions prevailing in each instance. The ranch methods and the farm practices of the best and most successful ranchmen and farmers in this and other states will be studied. Management of large and small farms, special farming and mixed farming, with the essentials governing each, will be carefully considered. Methods of laying out the farm, the arrangements of the fields for rotation of crops, systems of records for keeping reports of the crops of the different fields, with suggestions on farm marketing, will be discussed. Different cultural and crop methods under irrigation and semi-arid farming conditions, the housing of farm machinery, methods of checking the losses and husbanding the profits, will receive attention.

The farmer, as well as the business man in any other calling or profession, must have a clear grasp of the situation, intellectual equipment, executive ability and business methods if he would succeed in his business.

It is no longer true that "*anybody can farm.*" Farming is a business in which good judgment and skillful management of men measures the difference between success and failure.

The object of this course is to help young people from the farm to get a grasp of conditions, to learn from the experience of others and to avail themselves of aids and helps which have proven of value in the management of the ranch and farm.

Farm Mechanics

Professor Bainer.

Assistant: _____

Farm mechanics includes the study of farm machinery, farm buildings, farm motors, farm fences and gates, and the construction and maintenance of country roads.

The construction, elements of, and operation of the various tillage, seeding and harvesting machinery of the farm will be presented in this course; laboratory work will be given so students will become familiar with these machines and can successfully operate them.

Students will also study the construction, efficiency and durability of farm power machinery such as gasoline and traction engines, windmills, pumps, feed cutters and grinders, fanning mills, thrashing machines, etc. Students



Class in Farm Mechanics.

will be enabled to determine the relative cost of the different farm motors and in managing farms where power machinery must be used, they will be prepared to select that power which will prove the most economical for their conditions.

It is quite important for our farmer youth to be familiar with the arrangement, design, construction and cost of farm buildings; the different kinds of fences, their cost, efficiency and durability as well as the operating of fence building machinery.

Instruction will be given in planning the various farm buildings, testing strength, durability and value of different building material, proper arrangements for ventilation and windows for lighting buildings will be studied, together with location of the building site and the arrangement of the farm buildings for convenience and utility.

A study of the location and building of roads leading to the different parts of the farm, the essentials in the construction of country roads and practice in using road machinery will prove quite serviceable to our farm engineering students.

The first-year instruction will be given in the construction and operation of various farm machines. This will consist of lectures and demonstration work.

The second-year lectures and class demonstration work will be given in study of farm motors, buildings, fences, gates and farm roads as outlined above.

The College has over \$16,000 worth of farm and road machinery which will be used in class study and field demonstration work in farm mechanics.

Agricultural Chemistry

Dr. Headden and Professor Alford.

This course will be given during the first term of the second year, and will embrace the general subjects of soil and soil fertility. The questions pertaining to the relation of irrigation to the chemical changes which take place in the soil and its general conditions will receive fuller consideration that has heretofore been given to it in our work here. Some of the cultural problems as met in Colorado will be considered, particularly in regard to the use of green manures.

The general principles of feeding, considered from a chemical standpoint, will be given at the end of the course.

Our object will be to present these subjects in an elementary manner, but at the same time to present them fully enough to enable the student to gain a sufficient familiarity with these subjects to profit by the reading of the current literature on feeding.

Injurious Insects, Animal Parasites, Physiology and Hygiene

Professors Gillette and Johnson.

One hour a day during the second term of the second year of this course will be devoted to lectures upon insects.

A portion of this time will be spent in a study of the general structure of insects and the methods of classification in the more important groups. This knowledge is important as a basis for a good understanding of the habits of the various species and the remedies that should be used for their destruction, or the prevention of their depredations. The habits and instincts of insects in general will also be given some attention.

Following the general treatment of the subject, we will take up those species that are of most economic importance in Colorado. Members of the class will be shown species of the insects, and, so far as possible, the injuries that they do, and will be told what remedies may be used to prevent damage to crops. The more injurious insects that attack farm, orchard and garden crops, and also the parasites of our domestic animals will come up for consideration.

There are a great many parasitic and predaceous insects that are very beneficial to man by destroying his insect enemies. The student will be taught to distinguish these from the harmful forms.

The students will be taught also to prepare and apply the various insecticide substances, to test their purity, and to avoid fraudulent or useless preparations.

In the first term of the second year of the short course in domestic science and agriculture, a course of lectures will be given in physiology and hygiene. The plan is to lay special emphasis upon the subject of hygiene, giving only enough of the physiology to enable the student to better understand the laws of health. Among other topics discussed will be the following: Food, drink, clothing cleanliness, exercise, sleep, rest, pure air, pure water, drainage, sewage and infectious diseases.

Plant Life, Horticulture, Gardening and Forestry

Professors Paddock, Paull and Longyear.

Assistant: E. R. Bennett.

In this course a study is made of the simple processes of plant life so that the student may better understand the

conditions which produce certain results. This includes the various phases of propagation, germination of seeds, and the general relation of plants to environment.

The principles of vegetable gardening and floriculture are discussed, particular attention being given to special crops adapted to the numerous localities of the state. The



Class in Greenhouses.

growing of trees, shrubs and flowers for home adornment is also given some attention in the latter part of the term.

A general survey of the horticulture of the state is given in this course. A study of soils and their propagation; the planting and training of trees and choice of varieties; cultivation, pruning and spraying are some of the topics discussed.

Farm Bookkeeping and Business Accounts

C. G. Dwyre.

A course in farm bookkeeping and business accounts will be given to the students in this course. This will be especially helpful to young men who wish to secure a better

knowledge of business methods, the aim being to give a course of very practical instruction, training the student in the underlying principles of bookkeeping so that he may be able to keep a systematic set of accounts in connection with any enterprise associated with farming or live stock. A feature of the course will be the discussion of checks, drafts, notes, mortgages and commercial paper in general. Students will be taught to make out inventories and keep separate accounts with each division on the farm.



Practical Course in Agriculture

The instruction offered in the Practical Course in Agriculture will embrace the following studies:

FIRST YEAR.

First Term.

Plant Life, 30 recitations Professor Paull
Arithmetic, 20 recitations.
Veterinary Elements, 50 recitations Dr. Newsom
Farm Accounts, 50 hours; practice work Mr. Dwyre
Parliamentary Practice and Organization, 40 hours.....Mr. Iddings
Elementary English, 50 hours Professor Coen
Farm Mechanics and Shop Work, 100 hours; practice work.....
.....Professor Bainer

Second Term.

Soils, 20 hours; recitations Professor Olin
Live Stock, 30 hours; recitations Professor Morton
English, 50 hours; recitations Professor Coen
Stock Judging, 100 hours; recitations..Professors Carlyle and Morton
Soils, practice work; 50 hours.....Professors Olin and Knorr
Dairying, practice work; 50 hours.....

SECOND YEAR.

First Term.

Field Crops, 50 hours; recitations.....Professors Olin and Knorr
Live Stock, Feeding and Management; 50 hours.....
.....Professors Carlyle and Morton
Agricultural Chemistry Professor Headden
Physiology and Hygiene, 20 lectures..Professors Gillette and Johnson
Live Stock, 30 lectures Professor Carlyle
Forestry, 20 hours; lectures Professor Longyear
Irrigation Law and Constitution, 30 recitations Professor House
Live Stock or Horticulture, 100 hours....Professors Morton or Paull

Second Term.

Practical Entomology, 40 lectures Professor Gillette
Special Lectures, 10.
Farm Management, 50 recitations Professor Olin
Diseases of Live Stock or Horticulture.....
.....Dr. Kingman or Professor Paull
Gardening and Small Fruits, 20 lectures Professor Paddock
Bacteriology, 30 lectures Dr. Glover
Farm Mechanics, 50 lectures Professor Bainer
Practical Live Stock or Farm Mechanics, 100 hours.....

The Course Co-Educational.

The course is co-educational, all advantages being offered to both sexes alike. The studies are so arranged that while the young men are taking such work as pertains directly to practical farming and stock operations, the young women will receive training in sewing, cooking and such other work in domestic science and home-making as will be of the greatest benefit in equipping them for the proper management of their homes. A part of the work, at least, is offered to both boys and girls in the same class.



Domestic Science

Professor _____

Assistants: Misses Lottie Crawford and Rebecca Boswell.

The instruction offered in the Practical Course in Domestic Science will embrace the following studies:

FIRST YEAR.

First Term.

Plant Life, 30 recitations.
Arithmetic, 20 recitations.
Emergencies, 50 recitations.
Household Accounts, 60 hours; practice work.
Parliamentary Practice and Organization; 40 hours.
Elementary English, 50 hours.
Pattern Drafting and Plain Sewing, 100 hours.

Second Term.

Sanitary Science, 50 hours.
Marketing and Serving, 20 hours.
English, 50 hours.
Chemistry of Cleaning, 30 hours.
Dairying, practice work; 50 hours.
Cooking, 100 hours.

SECOND YEAR.

First Term.

Home Nursing, 50 hours.
Agricultural Chemistry, 30 lectures.
Physiology and Hygiene, 20 lectures.
Forestry, 20 lectures.
Irrigation Law and U. S. Constitution, 30 hours.
Millinery and Embroidery, 100 hours.

Second Term.

Practical Entomology, 40 lectures.
Special Lectures, 10.
Home Nursing, 50 hours.
Gardening and Small Fruits, 20 lectures.
Science of Nutrition, 50 hours.
Dressmaking, 100 hours.

The instruction in Domestic Science is designed especially for the girls and young women from the farm homes of Colorado. A series of lectures on the various foods, their



Class in Domestic Science.

composition and nutrient values will be a feature of this course; also demonstrations in the proper preparation and cooking of the various vegetables, meats, pastries, etc., will be given. No class of people in the world have equal facilities with those living on the farms for securing the choicest vegetables, meats, etc., and the only reason why their tables are not supplied constantly with the most wholesome and delicate dishes lies in the lack of skill displayed in preparing and cooking the food. This course will also provide instruction in the art of preparing the table and dishes, the proper service and all other matters pertaining to the dining room.

The course in sewing will include lectures and practice work in drafting patterns, cutting out garments, plain sewing, plain and fancy stitching, embroidery and millinery. Special attention is given to the matter of dress and dress-making.

The proper furnishing and care of the home will also be a feature of the course. While it is not intended that the young women will be given any extravagant or fanciful



Class in Sewing

ideas as to furniture, etc., it is desired that they shall be instructed in the art of making the home a place of joy and comfort.

The instruction given the young women outside of the home-making, cooking and sewing departments will include marketing, flower culture, dairying, chemistry, bacteriology, horticulture and the principles of judging, feeding and caring for live stock, particularly horses and dairy cattle. There is no reason why all the women on the farm should not have as much knowledge about the various types and breeds of horses and dairy cattle as the men, since they are constantly associated with these two classes of farm stock.

Military Training

If desired, a company will be formed for military training to be given three times a week. Boys coming from the farms will find these exercises of great value. Precision, promptness, erect carriage, expansion of the chest, and control of the arms and legs are some of the benefits to be derived. The young women will receive physical training in the gymnasium.

Equipment and Facilities

The College is located just outside the city of Fort Collins in the center of one of the most prosperous agricultural districts in the state. The College buildings are eminently adapted in both classrooms and laboratories for the work of instruction in agriculture. A new and commodious building to be used as a laboratory for farm mechanics has been completed for this division of the work. The College farm proper, with the stock barns and stables, joins the College campus and comprises some 300 acres. In addition to this, a beautiful tract of 153 acres of choice land a short distance from the main college farm has recently been purchased, besides a tract of 1,260 acres, all under fence, is utilized as a pasture for stock.

The College library is one of the best, and comprises several thousand volumes relating to the science of agriculture and general topics, besides several hundreds of stud, flock and herd record books published by the different live stock breeders' associations. These are valuable for research work in the study of pedigrees and lines of breeding.

The College is now in possession of the finest equipment of the different breeds and types of live stock to be found anywhere in the United States. The location at Fort Collins in connection with the College and Experiment Station of the United States co-operative horse breeding experiment, which now comprises fifty-four head of the highest type of carriage horses, gives us an equipment and facilities for the instruction in this class of live stock that cannot be surpassed in the world. In addition to this splendid equipment of horses, we have in cattle some of the finest specimens of the various breeds to be found in America or Great Britain. In the beef breeds we have some choice representatives of the Aberdeen Angus, Shorthorn, Hereford and Red Polled cattle, including the champion Aberdeen Angus cow of the Highland Agricultural Show of Scotland, and numerous others of equal merit.

In dairy breeds we have a choice herd of imported Ayrshire cattle, a small but exceedingly fine herd of Holsteins,

including the Grand Champion cow of the Universal Exposition at St. Louis, and the first prize and reserve to Grand Champion Holstein bull. We also have choice representatives of the Red Polled cattle representing the dual purpose type now so popular in many sections.

In the sheep division, we have representatives of four leading breeds, a large proportion of which have been imported, and a number won prizes at the St. Louis exposition.

In the swine department will be found choice specimens of five of the leading breeds, and an excellent opportunity is offered for studying these various breeds and types.

About \$16,000 worth of farm machinery has been secured and excellent facilities are afforded for the course in farm mechanics.

Requirements

Students must be at least 17 years of age and should have a common school education. No entrance examination is required. Young men at least 20 years of age who have practical knowledge of farming and live stock will receive the most benefit from the work offered to the young men in this course.

Certificates

Students who complete the studies of the entire two years of the short course in a satisfactory manner will receive short course certificates duly signed by the President of the College, the Dean of Agriculture or the Dean of Women and the Agricultural faculty.

Expenses

No tuition is required, but an incidental fee of \$3 will be charged each student for materials used. Board and room can be secured very readily in homes of citizens of Fort Collins at prices ranging from \$3.50 to \$5 per week. Books should not cost to exceed \$12 for the entire two years' work.

Date of Opening

Students will register on Monday, November 4. The term begins Tuesday, November 5, and will close on Wednesday, March 28, 1908. There will be a vacation of one week during the Christmas holidays.

For further particulars concerning the Short Course in Agriculture, address

DR. B. O. AYLESWORTH, President,
Or W. L. CARLYLE, Dean of Agriculture,
Fort Collins, Colo.



Course in Farriery

Officers and Instructors.

The President of the College.

The Dean of the Faculty.

.....	Preparation of the Foot and Shoeing
W. Elzinga.....	Forge Work
Prof. G. H. Glover..	Anatomy and Physiology of the Horse
Prof. W. L. Carlyle....	Types and Conformation of Horses
Dr. C. G. Lamb.....	Care of Horses' Feet
Dr. H. E. Kingman.....	Lameness and Disease

Course in Farriery or Horseshoeing

In the act of Congress appropriating funds for the establishment of Colleges of Agriculture and the Mechanic Arts in each state and territory, special reference was made to the Department of Mechanic Arts and the great need was pointed out of supplying some means of educating the various artisans and mechanics in their chosen callings. At the last regular meeting of the Colorado State Board of Agriculture it was decided to add to the already well equipped department of mechanics a course in practical and scientific farriery or horse shoeing. With the great development of the horse breeding industry in the West there has grown a pressing demand for skilled farriers or horse shoers. At present in Colorado it is almost impossible to find a skilled horse shoer who has sufficient definite knowledge of the anatomy of the horse's foot and the proper shoeing of it to adequately conserve the usefulness of the horse. When it is known that fully 60 per cent of the horses of America are laid on the shelf and their usefulness forever destroyed many years earlier than is necessary through the lack of proper care and protection of the foot by shoeing, it will be seen how necessary it is that some attention be given to this all-important branch of our College.

A horse is shod for various reasons, chief of which are to protect the foot from excessive wear, to prevent injury and increase the usefulness of the animal by preventing slipping on hard frozen or too smooth pavements and roads, to rectify in part faulty conformation of the feet and legs and to improve the action and general usefulness of the animal. The proper balancing and gaiting of driving or carriage horses has become a very important consideration, not only adding materially to their value on the market, but increasing to a marked degree their usefulness for the purpose intended. That a farrier may be competent to properly affix a suitable shoe to a horse's foot to accomplish the objects above mentioned it is absolutely essential that he have a specific and intimate knowledge of the anatomy any physiology of the foot and leg of the animal.

Believing that there are many men in the West who are desirous of knowing how to shoe horses in the best possible manner and who wish to obtain the greatest success in their chosen calling there is being offered for the first time the coming winter a course in farrier, in which will be given a scientific and practical training extending over a period of five months of two years, which will thoroughly prepare men in this important work. The course will open November 4, 1907, and will continue for five months for the first year, closing on March 28, 1908, and for the same length of time the following year.

The course briefly outlined will be somewhat as follows:

A good practical knowledge of the smith's art will be required of all those who take up the special work of shoeing the horse's foot. For those who do not already possess this knowledge, a preliminary course in forging is provided. Students will be trained in the regular forge room of the college in the elements of smithing. The care and management of the smith's fire will be taught first, as this is an important matter. Then a set of forgings will be made; these forgings are systematically arranged so that the student may be taught and advanced as rapidly as possible. They will begin with simple forgings in iron, bringing in, drawing, upsetting, bending and welding. Advancing gradually, the art of working steel follows the work in iron, and the student is taught to forge and temper steel, and make the various tools of his own trade. After reaching this stage in his training, the real business of horse shoeing, or farriery, is taken up. The student is now taught the anatomy and physiology of the horse; the foot especially is considered, the bones of the foot are studied, the articulation of the foot, the locomotory organs of the foot, the elastic parts of the foot, the blood vessels and nerves, and the protective organs of the foot are all carefully studied. The position to the entire limb is considered. The standing of the limbs, forms of feet viewed from in front, hind, and in profile, lines of flight of hoofs in motion, growth of hoof, and wear of the hoof, the physiological movements of the hoof. The sk

now has the student in charge, and the actual shoeing of the horse is taken up, and examination of the horse is made preparatory to shoeing, the proper method of holding the feet of the horse is taught. The student is taught how to properly remove the old shoes, and how to prepare the hoof for the new shoe, how to choose and make the new shoe, how to fit the new shoe, and how to nail it on.

He is taught how to properly shoe horses that forge or interfere, and how to gait and balance the horse. The care of shod and unshod hoofs is taught, also the use of oils and ointments.

Admissions

Applicants for admission should be at least 18 years of age and be possessed of a fair knowledge of reading, writing and arithmetic. Arrangements will be made whereby persons having already had some training in farriery may receive credits on the passing of prescribed examinations.

The tuition for the entire course will be free, but an incidental fee of \$3 will be charged for all students entering the course.

Certificates

Students who complete the studies of the entire two years in this course in a satisfactory manner will be granted a certificate duly signed by the President of the College and the Faculty of this particular department.

For further particulars concerning the course in Horse Shoeing, address

PROF. J. W. LAWRENCE,
Dean of Faculty, Fort Collins, Colo.



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DOES AGRICULTURAL EDUCATION PAY?



NEWS NOTES

NUMBER 308

PUBLISHED WEEKLY BY

THE COLORADO AGRICULTURAL COLLEGE

AND ENTERED AT POST OFFICE AT
FORT COLLINS

AS SECOND CLASS MAIL MATTER



The Farmer's Challenge

L. H. BAILEY

*“Blow ye winds and lay on ye storms
And come ye pests in rabble swarms
And fall ye blights in legion forms---
I am here: I surrender not
Nor yield my place one piece or jot;---
 For these are my lands
 And these are my hands
And I am born of the folk that resistlessly stands.*

*The blood of old ploughmen runs hard in my arm
Of axmen and yeomen and battlemen all
Who fought and who flinched not by marsh or wall
Who met the bold day and chased ev'ry alarm;
My father-kind sleep, but I hear the old call
And fight the hot battle by forge and by farm;---
 For these are my lands
 And these are my hands
And I am born of the folk that resistlessly stands.”*





A Dignified Industry

FARMING is no longer a question of "dirt and drudgery." The successful farmer is no longer a "hayseed," but a man of affairs. The more successful are recognized as scientists and their station in life is even envied by men successful in other lines of activity. Agriculture has prospered beyond other professions. In the last twenty years population has increased much more rapidly than has agricultural production. Prices are high and promise to go higher.

A NEW AGRICULTURE

The old system of mining fertile soil will no longer feed our population and a new agriculture waits for trained men to go into the field with it and grow two crops where one has grown before.

BRAIN ADDED TO BRAWN

The power of education to increase production on the farm is clearly shown in the case of 1,303 New York farmers for whom the agents of Professor Warren of Cornell University kept books for one year. Of these, those who had an eighth grade education or less, produced an average labor income

Attended
High School
—\$622
Per
Year



of \$318, while those who had attended high school had a labor income of \$622, while those who had attended a college of any kind had a labor income of \$847. Comparatively few of these had attended an



Untrained
—\$318
Per
Year

Agricultural College. While a recent study of the salaries of college graduates

First Year

Out of

Agricultural

College

\$1200

Per

Year



showed that graduates in agriculture of the Colorado Agricultural College their first year out of college, received an average salary of a little more than \$100 a month. Figures on the income of agricultural graduates who have been out of college for a number of years are not available, but a number of conservative estimates would indicate that this salary is doubled by the end of ten years. There is probably no other training at the present time

Attended
College
—\$847
Per
Year



which offers so large an increase in any capacity as education in one of the various phases of agriculture as offered by the Agriculture College.

DIVIDENDS FROM INTELLIGENCE RATHER THAN CAPITAL

The following table shows the relation of the owner's and the tenant's education to his income on 520 farms in Indiana, as observed and reported by the United States Department of Agriculture.

OPERATED BY OWNERS. (273 Farms)

Education	No. of Farms	Av. Size Acres	Average Capital	Av'ge Labor Income	Aver. Age
None at school.....	4	91	\$ 15,039	\$586	55
Common school	214	165	27,494	301	51
High school	46	206	37,725	651	46
College, etc.	9	240	42,781	796	53
Total or average.....	273	187	\$ 30,606	\$408	49.8

OPERATED BY TENANTS. (247 Farms)

Education	No. of Farms	Av. Size Acres	Average Capital	Av'ge Labor Income	Aver. Age
None at school.....	4	118	\$ 1,650	\$ 680	49
Common school	186	167	2,200	742	38
High school	51	190	3,203	1,268	33
College, etc.	6	294	3,351	1,721	41
Total or average.....	247	172	\$ 2,431	\$870	37

Although the tenants had only about one-tenth the capital of the owner, they made more than double their labor income, which indicates that brains and brawn are worth more than capital without them and is encouraging to the young farmer who must start as a tenant. But it should be further noticed that the few tenants who had a college education secured a labor income of \$453 more than those who had merely a high school education and



Studying Farm Machinery.

\$979 more than those who had a common school education, being more than double the income of the latter.

THE HIRED MAN

The number of salaried agricultural positions is increasing very rapidly. At the same time, a large number of agricultural graduates are refusing to



In the Experiment Gardens.

accept positions and are going back to the farm. Consequently the salaries which are commanded by trained agriculturists are comparatively much higher than in other professions. In the last four years the number of high schools employing instructors in agriculture has increased almost 500 per cent. Almost half of the men in these schools are teaching agriculture for the first time, most of them being graduates of the agricultural colleges the previous spring. The average salary paid these teachers with agricultural college training is \$1,200



Testing Soils

per year. The average yearly increase in salary for agricultural teachers is \$158, as against an aver-



Irrigation Laboratory

age of \$110 for teachers in other lines. In general, high school teachers of agriculture receive about \$300 more per year than teachers with equal amount of training in other lines, while teachers in special agricultural schools receive about \$550 a year more than they would receive for teaching in other lines.

One of the best known teachers' agencies in America says, "The demand for teachers of agriculture is far greater than the supply. The openings in the Department of Agriculture are numerous. Available graduates are few and salaries paid are above the average." Obviously there is a



Agricultural Hall.

large opening for high school teachers of agriculture and a college education will prove a profitable investment for those entering this work.

GOVERNMENT POSITIONS

The number of men with agricultural training required by the state and federal governments for extension, research and regulatory duties is rapidly increasing. The County Agriculturist work offers a new and enlarging profession. The Smith-Lever

COLORADO OPPORTUNITIES

Probably no state in the Union offers greater opportunities to train agriculturists than Colorado. This state has had its share of those who have failed to prosper by cultivating the soil. In almost every case it has been due to ignorance of the unusually fertile soil, the kindly climate or the use of water which when rightly applied makes a garden of the desert. The men who builded Colorado appreciated this and established the Agricultural College in Fort Collins to be one of the first and foremost institutions of the state, where, through co-operation of the federal government, an agricultural education based on Colorado conditions and needs, than which there is none better in our land, may be had by our youth with tuition free.

AGRONOMY

The varied agriculture of Colorado gives to Colorado Agricultural College a peculiar advantage not enjoyed by similar institutions of eastern and middle western states. Here are combined variations in soil and climate from an altitude of about three thousand five hundred feet to fourteen thousand feet adapted to the production of all the crops from a warm to a cold antarctic climate. It is the function of the Department of Agronomy to study these conditions of climate, soil, altitude and crop adaptability and their interrelation, and to teach their significance. This is done through courses covering Crop Production, Soils, Forage Crops, Farm Management, Plant Breeding, Soil Fertility, Farm Machinery, Farm Motors and Rural Architecture. The Department has excellent facilities for this study. The material equipment is good. The investigations and research work of the Agricultural Experiment Station, give an unexcelled fund of information on the varied agricultural conditions of altitude, dry farming and irrigation, and on farm management.



Athletic Club House



ANIMAL HUSBANDRY

Successful agriculture depends to a considerable extent upon a successful live stock industry. In this department training is given on types of live stock and the methods of feeding that will best utilize the natural and adapted crops of the region, for no livestock industry can be permanently successful which requires the importation of feeds from other states. Instruction is given in twenty-six courses, covering Judging of Swine, Horses and



Class in Stock Judging.

Cattle, Feeds and Feeding, Breeds of Farm Animals, Beef Production, Marketing Live Stock, Swine Husbandry, Pedigree Work, Dairy Manufactures, Animal Husbandry Seminar, Poultry Husbandry, Creamery Work and Dairy Inspection.

The college has a live stock equipment of high excellence. In addition, trips are taken each year under the leadership of instructors, to visit the leading live stock farms, and to the National Western Stock Show. These trips and the contact with men prominent in the live stock industry give the students at first hand the experience of old and successful stockmen. The head of the department is ex-officio State Dairy Commissioner.

HORTICULTURE

Few states have developed along horticultural lines with such rapidity as Colorado. Soils rich in the mineral elements, water applied when it is needed, almost constant sunshine and a climate conducive to plant growth, have combined to make an almost unprecedented horticultural growth, with a present production of twelve thousand cars of fruit or seven million bushels, not including such small fruits as strawberries, raspberries and cantaloupes.



FORESTRY

The awakened public conscience with regard to national wastes has made scientific forestry an important vocation. The increasing demand for timber, for shade, shelter, lumber, posts and firewood has made a great opportunity for students of forestry. In order to meet this demand for men, a strong course is offered at the College. The Professor of Forestry is ex-officio State Forester.

The student has every opportunity to become acquainted with the development of this work in the State. A well equipped timber preserving plant is



Forestry Lodge.

operated in co-operation with the U. S. Forest Service. The field work of the State Forester, and special investigations in fire control, timber culture etc., give the student many opportunities for practical and experimental work in connection with his course. A splendid forest reserve extending from the foothills to timberline west of the College with a substantial forest lodge in beautiful Pingree Park, at an altitude of 8,500 feet, offers unusual opportunities for summer study. A complete saw mill provides first-hand experience in timbering.

The Supervisor of the Colorado National Forest is located at Fort Collins and often employs students for work in the forest during the summer vacations.



The Colorado Agricultural College offers ten courses to students who have completed a four-year high school course. These courses are Agronomy, Animal Husbandry, Entomology, Forestry, Horticulture, Electrical Engineering, Mechanical Engineering, Civil and Irrigation Engineering, Domestic Science, Domestic Art and General Science, Veterinary Medicine. A three-year course of six months each year in Agriculture, Mechanic Arts, and Home Economics is offered to young men and young women who have completed the eighth grade. A summer session of six weeks is held beginning in June each year.

For further information address,

CHAS. A. LORY, President,
Fort Collins, Colorado.



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Rules and Regulations

Governing the

Colorado Patterson Seed Selection Competition

Conducted by

The State Agricultural College.

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Mr. F. Alford....	Assistant in Chemistry
Mr. Earl Douglass.....	Assistant in Chemistry
Mr. B. O. Longyear...	Assistant in Botany
Dr. I. E. Newsome ..	Assistant in Veterinary Science



A Study in Seed Selection.

A—From strong vigorous seed of good yielding power.

B—Vital seed, but with low yielding power. Found in same field.

C—Weak vitality and low yielding power, seeded with A and B in a Colorado grain field, season of 1905.

Announcement

Hon. Thomas M. Patterson, United States Senator for Colorado, has generously placed at the disposal of the Department of Agronomy of the State Agricultural College the sum of \$2,500, to be known as the "COLORADO PATTERSON SEED SELECTION COMPETITION FUND," for the purpose of encouraging the farmer boys and girls of Colorado to study seed selections in wheat, oats and barley grown on the home farm. It has been decided to use this fund in prizes which shall be offered for the best field results obtained from seed selections in small grain. These prizes are to be divided into the following groups:

I. ANNUAL PRIZES FOR 1906, 1907, 1908.

Ten prizes will be given on each of the five classes of grain, fall wheat, a drouth resistant wheat, spring wheat, barley and oats—for each year's selections—(1906, 1907, 1908).

II. THREE YEAR PRIZES.

Seven prizes will be awarded on the results obtained from the use of selected seed for three successive years. This is the final test of good seed selected and the prizes are therefore larger, making this the important part of the Seed Selection Competition.

The rules governing these contests explain how the annual and three-year competition will be conducted.

Rules and Regulations.

Any boy or girl residing in the State of Colorado who has not passed the eighteenth birthday before the first day of January, 1906, is eligible to compete for the prizes offered.

There will be a yearly competition in each of the three years, 1906, 1907 and 1908; and there will be a three-year competition covering this three-year period.

Any two or more boys or girls, two or more of whom have entered the competition, may form themselves into a club for the purpose of conjointly competing. The names and addresses of all the members of such club, with the name of the president of said club, should be forwarded to us with the selection for the yearly competition, or the report for the three-year competition. The club shall be known as The Seed Selection Club." (It is suggested the postoffice be used to name the club.)

III. FOR THE YEARLY COMPETITION.

For the 100 heads of wheat, barley and oats that are forwarded to our address by competitors who have complied with the rules and regulations herein specified, there will be prizes awarded for each, as follows:

	Fall Wheat.	Spring Wheat.	A Good Mill- ing Type of Drouth Resistant Wheat.	Barley.	Oats.
1st prize.....	\$20	\$20	\$20	\$20	\$20
2nd prize.....	16	16	16		16
3rd prize.....	12	12	12	12	12
4th prize.....	10	10	10	10	10
5th prize.....	7	7	7	7	7
6th prize.....	5	5	5	5	5
7th prize.....	4	4	4	4	4
8th prize.....	3	3	3	3	3
9th prize.....	2	2	2	2	2
10th prize.....	1	1	1	1	1
	\$80	\$80	\$80	\$80	\$80

Any 100 heads may be picked from the acre entered for competition. One mark will be awarded for every seed on the 100 heads, and 25 marks for every gram (in weight) which those seeds weigh. For example: The best 100 heads of wheat received from the competitors in 1906, provided they contained 6,703 kernels of grain, would make 6,703 marks; and provided it weighed 266 grams, would make 6,650 marks—total number of marks, 13,353.

Any competitor may make entries in all five classes of grains—fall wheat, spring wheat, drouth resistant wheat, barley and oats—or he can make entry in but one class. No person will be privileged to make more than *one* entry in *each* class.

IV. FOR THE THREE YEAR COMPETITION.

The three year competition is for the years 1906, 1907 and 1908. The competitors who have complied with the rules and regulations herein specified, and have obtained the largest number of marks at the end of the three years, will be awarded prizes for each of the grains as follows:

	Fall Wheat.	Spring Wheat.	A Good Mill- ing Type of Drouth Resistant Wheat.	Barley.	Oats.
1st prize.....	\$ 80	\$ 80	\$ 80	\$ 80	\$ 80
2nd prize.....	60	60	60	60	60
3rd prize.....	40	40	40	40	40
4th prize.....	25	25	25	25	25
5th prize.....	20	20	20	20	20
6th prize.....	15	15	15	15	15
7th prize.....	10	10	10	10	10
	\$250	\$250	\$250	\$250	\$250

V. HOW MARKS ARE AWARDED.

Any acre of either wheat, barley or oats, on the farm at which the competitor lives, may be selected for 1906.

a. One mark will be awarded for every pound in weight of grain of good quality obtained from the acre in 1906.

b. Before the grain is harvested in 1906 a quantity of large heads shall be selected to yield enough heavy plump seeds to sow one acre in 1907; and *two* marks will be awarded for every pound in weight of grain of good quality obtained from the acre in 1907.

c. Before the grain is harvested in 1907, a quantity of large heads shall be selected to yield enough heavy plump seeds to sow one acre in 1908; and *three* marks will be awarded for every pound in weight of grain of good quality obtained from the acre in 1908.

d. The competitor who obtains the largest number of marks in the *total* of the three years (1906, 1907, 1908) will receive the first prize; the competitor who obtains the second largest number of marks, the second prize; and so on for the seven prizes.

For example: Total yield of wheat from seed acre plot in
 1906 may be 25 bu., which equals 1500 lbs., thus making 1500 marks
 1907 " " 30 bu., " " 1800 lbs., " " 3600 "
 1908 " " 35 bu., " " 2100 lbs., " " 6300 "

Total number of marks 11400

The competitor having three or more acres in wheat, oats and barley, who receives the highest marks over all, in the Three Year Competition, will be awarded a gold medal, costing not less than \$50.00.

VI. EXPLANATIONS.

Competitors for the three year competition are not *required* to enter the Yearly Competition with 100 large heads, but they must comply with the rules for securing the seed and otherwise operating the seed grain plot.

Each competitor who forwards 100 heads of grain for the Yearly Competition, or reports the yield of grain for the Three Year Competition, must operate a seed grain plot according to the rules and regulations herein specified. Two lots of 100 heads each from the same SEED GRAIN PLOT, which consists of one acre of land, will *not* be accepted and judged *as from two* separate competitors.

The seed grain plot from which any competitor selects 100 heads of grain for the yearly competitions for 1906, 1907 and 1908, and from which the yields of grain for the years 1906, 1907, 1908, are reported, must be accurately measured by competitor with the help or instructions of teacher and parent, or teacher and guardian, and must contain not more than one acre of land.

Instructions for 1906.

VII. SELECTION OF PLOT.

If a special seed grain plot, consisting of one acre of land, has not been prepared for the competition, a plot of one acre, by measurement, may be selected in any one of the fields; and that acre may constitute the seed grain plot for this year.

VIII. HOW TO SELECT A PLOT.

Let a piece of land be selected on which the grain is growing and which appears to be superior to any other part of the field for producing and maturing a large quantity of grain per acre, of the very best quality.

The production of a rank growth of straw must not be mistaken for a superior quality of large plump, early maturing and heavy yielding grain. A plot of land producing a growth of rank straw, on which the crop will continue to grow and remain green after the proper time for ripening has come, should not be used as a plot from which to select seed grain. We need early ripening types of grain for Colorado. The plot of land most desirable for a seed grain plot is one producing a strong growth of plants, during the early part of the season, on which the grain will ripen early and evenly. It should be an acre of land that will produce well stooled plants, having large heads, filled with large plump grain.

IX. MEASUREMENT OF GRAIN PLOT.

It will be necessary for each competitor to measure accurately the land from which the selection is to be made and the yield reported.

The size of the plot for each competitor must be EXACTY ONE ACRE. The shape of the plot is left to the discretion of the competitor, as long as it contains exactly 160 square rods.

For instance a plot may be

40	rods	by	4	rods	—	160	square	rods	or	one	acre
25	"	"	6.4	"	—	"	"	"	"	"	"
20	"	"	8	"	—	"	"	"	"	"	"
10	"	"	16	"	—	"	"	"	"	"	"

A measuring tape 66 feet (4 rods) in length would be suitable for measuring the plot; as a substitute a measuring pole, or such other device as may be *accurate* for the *purpose* may be used.

In measuring, stakes at least 30 inches in length should be firmly set to indicate the boundary lines of the plot.

X. SELECTION OF HEADS.

Before the grain on the seed grain plot is harvested, sufficient heads of grain must be selected—picked by hand in the field—to produce enough large plump grain for the seed grain plot (1 acre) for 1907. It is considered advisable to allow grain, intended for seed, to ripen more fully than grain for milling or feeding purposes. It might be a good plan to leave the grain on the seed grain plot standing until the surrounding grain is harvested, thus allowing it to become fully matured. If, however, it is desired to obtain an earlier ripening strain of any variety, the selecting should be done as the earliest heads become mature.

Before commencing the work of gathering the heads from the standing grain, the persons selecting should observe closely the differences that exist between individual plants. Some do not stool so much as others. In some the stools or secondary stalks are weakly and much shorter than the main or first stalk that appears from the seed. The grain in the heads of some plants is more uniform in size than in others. In many plants the heads of grain contain small, poorly developed kernels in the lower and end spikelets, while the kernels in other heads of the same variety, growing by their side, are fairly uniform throughout. The best heads from the most robust, large and productive plants should be selected. The *whole plant* and not the *head only* is to be considered.

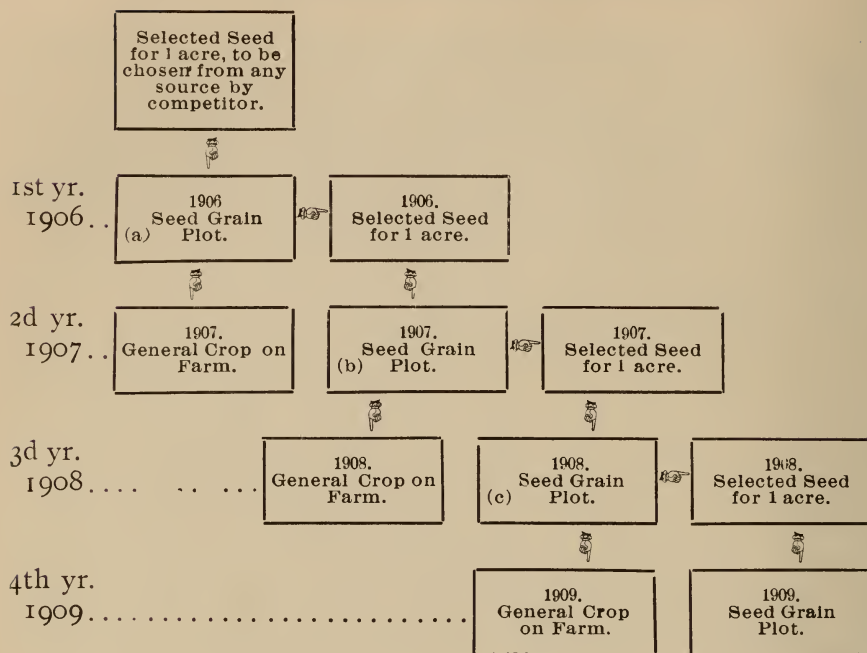
An *ideal* type of both plant and head should be fixed in the mind of the selector before the work is commenced, when he or she should proceed systematically and carefully to select as near the ideal as possible.

When sufficient grain has been gathered to produce enough large plump seed for the acre seed grain plot, for the following year, 100 of the *largest* and *best developed heads* may be selected from those which have been gathered for seed, and forwarded to the Agronomy Department of the Colorado Agricultural College as the selection for the Yearly Competition.

XI. HARVESTING THE GRAIN.

It is necessary that the grain on the seed grain plot shall be harvested, threshed and weighed by itself. It is expected that the grain thus obtained will be stored separately and *thoroughly cleaned* and *screened*. It is suggested that the large plump grain from that particular acre of land be used as the seed grain for the general crop on the farm for 1907.

XII. CHART SHOWING PLAN OF SELECTIONS.



(a) One mark allowed for each pound of grain per acre. (b) Two marks allowed for each pound of grain per acre. (c) Three marks allowed for each pound of grain per acre. The index hands show disposition of seed grain.

(This plan and these rules are modeled after those now in successful operation under direction of the Canada Seed Growers' Association.)

XIII. SUMMARY OF EXPLANATIONS.

It has been stated already that before the grain on the seed grain plot is harvested this coming year (1906), each competitor must select—pick by hand—sufficient heads of grain, as per instructions, to seed the acre seed grain plot the following year (1907). In 1907 the same process must be repeated for the acre grain plot for the year 1908; and in 1908 sufficient heads must again be selected to secure large plump seed for an acre grain plot of 1909. A pound sample of this cleaned grain (crop of 1908) shall accompany the Three Year Competition. In every case the grain selected for the seed grain plot must be threshed and stored separately; it must also be carefully screened or hand picked before being sown the following year. Each competitor must continue through-

out the competition with the same variety from which the first year's selection (of 1906) is made.

Special preparation must be made for the seed grain plot for 1907, and also for 1908. The most suitable one acre of land on the farm which is available for such purpose should be specifically prepared and used for the production of seed grain. The seed grain plots for 1907 and 1908 must be prepared, sown, and kept distinctly separate from the surrounding crops.

The 100 heads for the Yearly Competition must, in every case, be taken from (1 acre of land) the seed grain plot only.

All competitors forwarding heads of grain as their selection for the Yearly Competition must bind them together securely, enclose them in a cotton bag of sufficient size and strength, securely attach a label, and address it to Agronomy Department, Colorado Agricultural College, Fort Collins, Colorado, indicating contents by the words, "For Colorado Seed Grain Competition." Each lot must contain exactly 100 heads of grain. A card or paper should be put inside containing the name and address of the sender, and the name of the variety of grain.

Each competitor must, according to the best of his or her knowledge, fill in replies to the questions asked in the blank forms sent out from time to time, as well as the report of the yield of grain each year from the acre seed grain plot. That the work has been properly done, according to these rules and regulations, and that the report of the yield from the seed grain plot is correct, must be certified to by the teacher and parent, or the teacher and guardian, who have personal knowledge of the way in which the seed grain plot has been operated and who have witnessed the measuring and harvesting of the plot, and the threshing and weighing of the grain.

An ounce sample of seed grain selected for crop of 1906 shall be sent to the Agronomy Department on or before May 1st, 1906. This will be filed for comparison with sample sent from crop of 1908.

It is expected that all competitors will furnish such information as may be asked regarding their operations to any person or persons who may be authorized by the Professor of Agronomy of the Colorado Agricultural College to visit them and inspect their work.

W. L. CARLYLE,
Dean of Agriculture.

W. H. OLIN,
Professor of Agronomy.

July 1st, 1905.

Suggestions to Competitors.

It is suggested that persons living in those regions of the state where fall or winter wheat is successfully grown make their contest with winter wheat; persons living in those regions of the state where spring wheat is successfully grown are advised to make their contest with a spring wheat; persons living in those regions of the state where irrigation is not possible, but where durum wheats can be grown more successfully than other types of wheat, are urged to make their contest with Kubanka durum wheat or some other equally good drouth resistant wheat. Since the Yearly and Term Contests begin with the crop of 1906, those wishing to enter the contest with winter wheat should at once select their seed for the fall planting. We would suggest that your first seed stock be selected with great care, as it becomes the parent seed for your term contest.

Remember the universal law of plant breeding—"Like begets like." Therefore choose the wheat that has good physical qualities, that represents a desirable milling type and which you believe adapted to your soil and climatic conditions.

In a similar manner select your seed oats and seed barley for the spring planting.

Those living in the semi-arid regions where irrigation is impossible should obtain seed grown in regions as near their own, in climatic conditions, as possible,—*provided* seed of the desired quality can be obtained. If this be impossible, obtain seed from northern latitudes not under excessive humid conditions. Persons living at higher altitudes should obtain seed stock grown as near their altitude as practicable. If desirable seed cannot be obtained which meets altitude requirements, then get northern grown, *not* southern grown seed.

Buy your seed stock on *sample only*. In case the sample is satisfactory in every other quality, test its vitality by germinating either in sand, soil or cigar box test.

(a) *The Cigar Box Test*.—Place several thicknesses of moistened blotting paper in the bottom of a cigar box. If blotting paper cannot be obtained, use newspaper. Now distribute 100 kernels of the grain to be tested on the moistened paper in such manner that each kernel lies by itself. Cover the grain with several thicknesses of paper, taking the precaution to write name of grain and date on a slip of paper, which should be placed with grain to be tested.

Several samples can be placed in the cigar box if careful to place several thicknesses of paper between each sample. See that all papers are *well moistened*. Now close the lid and tie it down with a string to prevent too rapid evaporation of moisture. Place box in living room or any place where the temperature will not

Colorado Seed Selection Competition Entry Blank.

W. H. OLIN,

DEPARTMENT OF AGRONOMY,

COLORADO AGRICULTURAL COLLEGE,

FORT COLLINS, COLO.

Dear Sir:—

I will enter the Colorado Seed Selection competition. I desire to make entry for:

Competitor shall enter the name of variety of grain or grains which he or she wishes to grow in the competition.

Name _____

Postoffice _____

County _____

Date _____

[Fill in entry blank and return as soon as you decide to take up this work.]

fall below 55 deg. or 60 deg. or go above 90 deg. Examine box daily, keeping papers moist. At end of seven days take out samples and examine carefully. Every kernel not yet sprouted, sending out a good stem sprout and a vigorous root sprout, should be noted. If these number more than eight or ten out of the 100 kernels tested, discard the sample for seeding purposes. Three sets of 100 kernels each should be put to the germination test for each sample of grain selected or chosen for seeding purposes. If the average of these three tests is less than 90 well sprouted grain kernels, better 95, do not consider the sample for seeding purposes. You want *good, vital seed* for your contest.

(b) *The Sand and Plate Test*.—Fill an ordinary dinner plate rounding full with well moistened sand. Plant 100 kernels, of the grain sample under test, one inch deep in this sand, taking the precaution to press the sand well down on the planted seed. Cover with another dinner plate to prevent excessive evaporation. The same should be so placed that the edges of the two dinner plates shall meet all the way round, or *nearly so*. Set the plates away as per directions in cigar box test. Take precaution to replenish water as often as need be to keep sand well moistened. At the end of seven days begin counting sprouts daily. On the tenth day dig up the seeds and note number and character of sprouts, as described in cigar box test.

(c) *Soil Test*.—Place good mellow dirt one and one-half to two inches deep in box of sufficient size to hold 100 planted seeds placed at least one inch apart each way. Plant one inch deep, the same as in plate test. Keep soil *moist*, but not too wet, and keep box in a favorable temperature for growing plants. Count number of sprouts appearing on tenth day and examine as in tests above described. If the germination is less than 90 per cent. (better 95 per cent.) do not purchase from the seed stock represented by the sample tested. Use for your seed, grain which satisfies you, has good physical qualities, the kind of wheat, barley or oats which you wish to propagate and which tests as near 95 per cent. germinating power as possible.

We should have 10,000 competitors for these prizes among our farmer youth.

Enter this seed competition and help make our Colorado grains *first* in *quality* and *yield*. You have an opportunity to make \$500 and, at the same time, teach us all a most important object lesson in grain culture. Sign enclosed entry blank and at once begin your search for seed grain.

W. H. OLIN.

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1906.

Course in Civil and Irrigation Engineering

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Camp at Timber-line.

This Party Ran Levels to Top of Long's Peak, in Background, Four Miles Away. El. 14255 Feet.

Civil and Irrigation Engineering Department.

LOUIS G. CARPENTER, M. S.,*

Professor of Civil and Irrigation Engineering.

EDWARD B. HOUSE, M. S., E. E.,

Associate Professor of Irrigation Engineering.

ROBERT W. GAY, C. E.,

Associate Professor of Civil Engineering

RALPH L. PARSHALL, B. S.,

Instructor.

ROBERT E. TRIMBLE, B. S.,

Irrigation and Meteorology.

MARGARET MURRAY,

Stenographer.

Instructors in other Departments who give instruction in this course:

BARTON O. AYLESWORTH, LITT. D., LL. D.,

President and Professor of Political Economy and Logic.

JAMES W. LAWRENCE, M. E.,

Dean of the Faculty.

Professor of Mechanical Engineering.

WILLIAM P. HEADDEN, A. M., PH. D.,

Professor of Chemistry and Geology.

VIRGINIA H. CORBETT, B. L.,

Professor of History and Literature.

WILLIAM RUSSELL THOMAS, A. B., LITT. D.,

Professor of Constitutional History and Irrigation Law.

S. L. MACDONALD, B. S.,

Professor of Mathematics.

CHARLES A. LORY, M. S.,

Professor of Physics and Electrical Engineering.

B. F. COEN, B. L.,

Professor of English.

*State Engineer of Colorado 1903-1905. Consulting Engineer for Colorado. Kansas-Colorado Case 1902-1907.

Civil and Irrigation Engineering Department

HARRY D. HUMPHREY, U. S. Army (Retired),
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FRED C. ALFORD, M. S.,
Chemistry.

MARGUERITE R. FRINK, B. A.,
MARIE T. GILL, M. A.,
Mathematics.

F. N. LANGRIDGE, M. E.,
Mechanical Engineering.

WILLIAM ELZINGA,
Forge and Foundry Practice.

ALBERT CAMMACK, B. M., E.,
Mechanical Engineering.

HIRAM PIERCE,
Carpentry.

CLAUDE J. ROTHGEB,
Physical Director.

JOSEPH F. DANIELS,
Librarian.

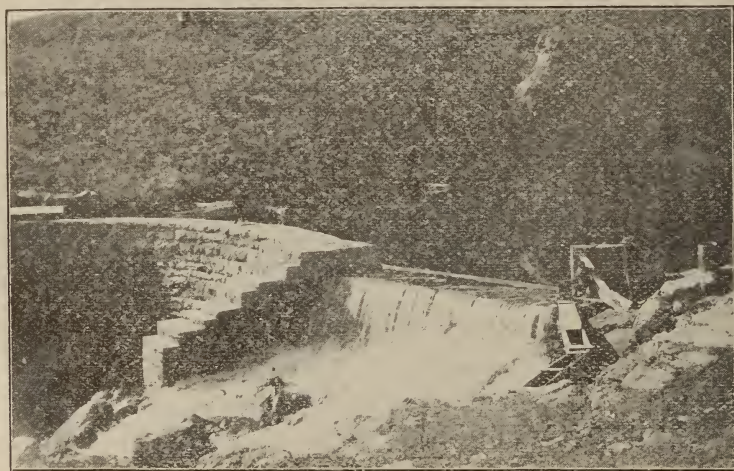
SARAH I. KETTLE, A. B.,
Modern Languages.

MIRIAM A. PALMER, A. M.,
Drawing.



The course in Civil and Irrigation Engineering was organized in the Colorado State Agricultural College in 1889. It is provided for by the United States appropriation given under the Morrill Act establishing Agricultural and Mechanical Colleges. The fund arising from the original Morrill Act and from the subsequent appropriation of Congress of \$25,000 per annum, is for the purpose of teaching branches relating to Agriculture and the Mechanic arts, including Civil and Irrigation Engineering, as interpreted by the Government department having this fund in charge. It was the first course in these subjects to be started in Colorado, and the first in Irrigation Engineering in the United States.

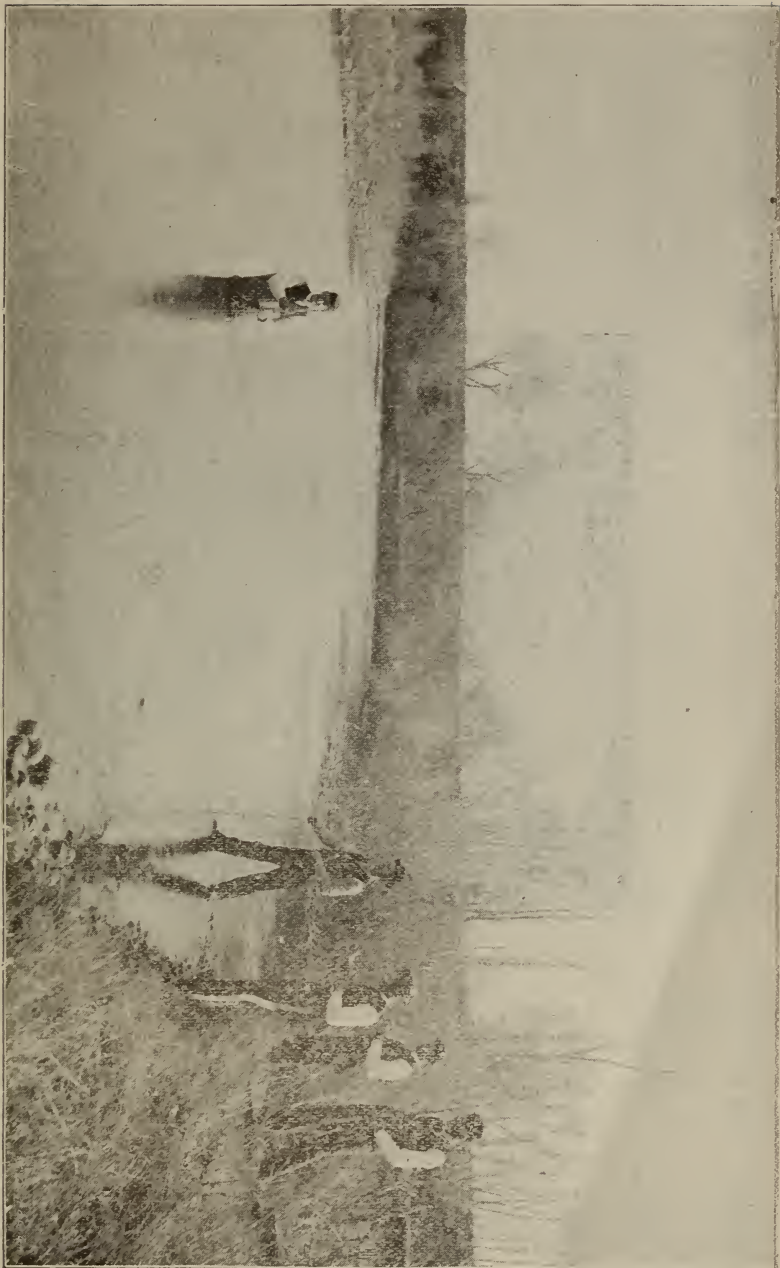
The need of such training in a State whose development is rapid, is great, and the call for engineers is very large. The fundamental purpose of the course is first to train the student as a man so that he may be prepared for active usefulness in any line of work



A Masonry Dam 55 Feet High Within a Few Hours with Horse.

whether it be in engineering or not. It is believed, however, that the training of the engineer is such as fits a young man for many active lines. The idea throughout the course is to train young men for any line of usefulness. The training in engineering develops two important characteristics, important in any occupation. One is to learn to judge things as they are, not as others think; the other is the art of handling men and materials to accomplish the greatest results at the least cost. It should result in practical judgment based on sound comparison of causes and results.

The course as given at the Colorado Agricultural College compares favorably with the corresponding courses in the leading technical schools in the country. It lays more stress on those features



A Class Exercise in Measuring a Stream.

peculiar to a country where irrigation is a necessity, and hence a larger amount of time is given to instruction in hydraulics and related subjects. The instruction is thorough and the equipment the best. Teaching is done by means of text-books, lectures, experimental work in the various laboratories and practical work in the field.

A special effort is made to develop the self-reliance of the student, and to qualify him to do active work based on skill in the use of the instruments, if he desired. There is also effort to develop the student's own judgment and his power of handling problems through his own initiative. Upon completion of the course the graduate is ready to enter upon the active practice of his profession and is well grounded in the principles underlying engineering practice. Our



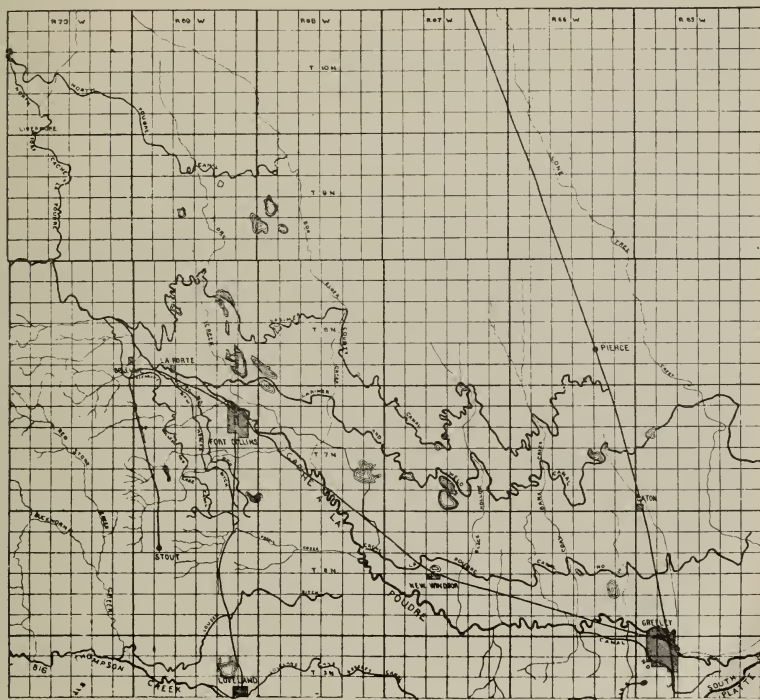
Leveling in the Region of Perpetual Snow.

students have found ready employment and have made good in the various places which they have filled.

Location.—The location is at Fort Collins, an active, enterprising town of 11,000, seventy-three miles from Denver on the Colorado & Southern railroad, with four passenger trains daily connecting the cities. It is one of the richest regions under irrigation in the United States, if not in the world. There are many engineering enterprises nearby, especially those relating to irrigation. These include canals, reservoirs, dams, water works. In the State there are varied engineering constructions of the highest type, including water power, mining enterprises, masonry and earthen dams, mountain railways and

many other instances of the art of the engineer. Some of these are visited by the various classes.

Equipment.—The Department is well equipped with transits, 9; levels, 9; compasses and necessary tapes, rods, range poles, etc., in corresponding proportion. Plane table, planimeter, odometer, current meters of various patterns, nilographs, testing machines, etc., are also available. The Department is also provided with models of flumes, headgates, dams, etc., to show the modern forms of construc-



This Map Made in 1896 Fails to Show Many of the Reservoirs Since Made.

tion, and many photographs. The testing laboratory contains a testing machine fitted for testing materials in compression and tension to 50,000 pounds, and also a cement machine testing to 1,000 pounds. There is also a dark room for photographic instruction and cameras which are used in that work.

The large shops and supply of tools of the Mechanical Department are used for the instruction in shop work both in wood and iron.

One of the most important parts of the equipment are the many instances of engineering work within a moderate distance. Many

large earthen dams with reservoirs ranging from a few hundred to a thousand acres, canals carrying as much as 900 cubic feet of water per second, headgates of modern construction, together with the best examples of distributing systems and methods of handling water that have developed under modern irrigation practice, all of which can be seen within a few miles of the College. Other important works are under construction. The reservoirs within a few hours' ride of the College are estimated to have cost several millions of dollars. The



A Stream Measurement at an Elevation of 9,000 Feet.

State affords some of the most noteworthy examples of engineering works in all branches; power plants, railroads, shops, tunnels, etc. Students are encouraged to visit these. Many are near at hand.

Course of Study.—Besides the technical studies it is desired to give the student an all round training to as great an extent as possible. This includes, therefore, not only a knowledge of technical matters, but also training in English and other lines which the educated person needs to know in order to be recognized in his community and in order to get the most out of life. While endeavoring to give

intensive knowledge in some lines, it is hoped to avoid the extensive ignorance of others of which technical courses are often accused.

English, Constitutional History and Law—Rhetoric. It is the design of this study to train the student in English composition in both theory and practice, and by the study of the fundamental principles of style, to aid him in an intelligent appreciation of literature. Further practice is given in this line in the preparation of theses and in the work of Seminar.

As a citizen the student needs to have instruction in the principles of Constitutional History and Law. The study of the Constitution

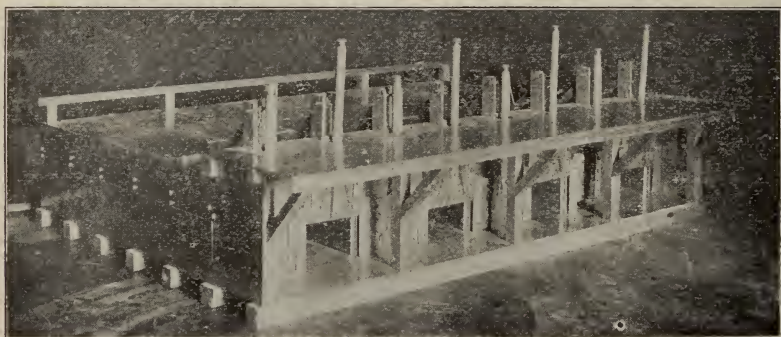


Two Leveling Parties on the Highest Rock of Long's Peak. El. 14255 Ft.

of the United States and the development of the free institutions is a prominent study of that course, especially during the Senior year. Closely associated with this work is the study of Political Economy. These following a thorough course in History cover in a comprehensive manner the various political sciences and will be found of every day practical advantage to all graduates when they enter upon the real active duties of life.

Chemistry.—The course in this study has been planned to present the principles of the science and such facts as are necessary for a reasonably thorough understanding of these principles. This is supplemented by laboratory practice in analysis.

Mathematics.—Mathematics is especially the tool of the engineer. It is desirable for training in reasoning, but especially as a part of the equipment, hence the application is kept constantly in mind. The different subjects are taken up in order and as fully as the time permits. Some preparation is required for entrance. In the Freshman year, College Algebra to quadratics is taken. One term is given to Trigonometry. This is of special importance for its use in engineering computations. It is preliminary to the study of surveying. Analytical Geometry is taught in the last term of the Freshman year. The student is made acquainted with the method of co-ordinates and the relation between algebraic forms. The principles of Differential and Integral Calculus are studied during the Sophomore year. Further use of Calculus is made in studying Strength of Materials and Hydraulics, and many other studies. Descriptive Geometry, including the principles of projection, intersection, development, etc., are discussed. The study is used as an added means to give carefulness in the practice of drawings and plans.



Model Made to Scale of a Headgate.

Physics.—The work in Physics has two principal purposes in view. First, the thorough grounding in the mind of the student of those fundamental principles of the science that form so much of the foundation upon which all subsequent specialization in engineering rests; second, the testing for himself applications of these principles in the laboratory, thereby developing his reasoning power, quickening his powers of observation, giving skill in manipulation, and leading to a high ideal of truth and honesty.

The aim of the work in Applied Electricity is to give the advanced students that knowledge of the applications of electricity in their line of work that the increasing use of electricity in all industrial work demands.

Drawing.—Drawing includes both geometric and free-hand drawing. It is especially desired to give some skill in attaining a knowledge of geometric problems, orthographic and isometric projections,

and the development and intersection of surfaces. Free-hand drawing is especially from models. Drawing is taught not so much to give skill in the use of the pencil as to give training to the eye. There is much practice given in the drawing of maps in engineering work, field work, etc., throughout the entire course. Also drawing from actual models of hydraulic construction, as flumes, dams, etc. Neat and legible lettering is required on all drawings throughout the course.

Field Work.—More than usual attention is given to training in field work. It begins with surveying in the Spring term of the Freshman year, and continues throughout the course. In the Freshman year chaining and the use of the compass and level are taken up. The Sophomore year is given more especially to training with the transit. A working skill in the use of the level and transit is required, and with the practice thus given—the graded exercises and the field camp—it is intended to give such working knowledge by the close of the Sophomore year.

Surveying.—Land surveying and computations, leveling in the Freshman year, the varied use of the transit, in the Sophomore year, and other forms of higher surveying, including city, topographic, hydrographic, railroad surveying, including curves; earth work and computations, railroad economics, etc. The work of the class room is supplemented by work in the field.

Such practice is given during the term by afternoon practice in the vicinity of the College. To give better training the engineering students report for work in the field two weeks before the opening of the Fall term, and under the charge of instructors, form an engineers' camp in the mountains, and devote the full time for two weeks to this work, without interference from other work. The work is in charge of competent instructors. The older students act as chiefs of parties, and the newer students as assistants, thus acquiring the benefit of the experience of the older ones. For some years Estes Park has been chosen. Camp has been formed at an elevation of from 8,000 to 10,000 feet. Work selected has had a practical bearing. The classes have surveyed reservoir sites, made plans for dams, and filed in accordance with the State laws. Others have run level lines to the summit of Long's Peak, 14,255 feet in elevation, a most difficult test of nerve, skill and endurance. The older classes are given special work. They have, for instance, made a reconnaissance triangulation for a long tunnel through the range, camping at timber line, working plans for dams of the reservoirs surveyed, etc.

While there is hard work on the trips, no earnest student shrinks from that, and there has been much pleasure in addition. The students return in good physical condition, with unusual self-confidence and broadening of ideas from the exhilarating contact with nature in her high elevations.

The College furnishes most or all of the permanent equipment. The students control the commissary through a committee. The fee to cover the expense is \$10, a sum about the cost for the same time in town. This amount has been found insufficient in the past, and

may need to be slightly increased. The students report in camp this year, Tuesday, August 27, paying their expense of transportation, this being as they may arrange. This averages about \$4. Each student supplies his bedding and personal belongings.

Throughout the course the afternoons are used for field or laboratory work, the special character varying as indicated by the course of study. Much time is given to work calculated to develop the student's power of thought.

Hydraulics.—The character of the development of the West, and especially of Colorado, has emphasized the need of training in all matters bearing upon irrigation engineering, and hence there will be noted the emphasis given to hydraulics, and other related lines. The engineer without knowledge of this kind is out of place in the West, and the character of development in the East makes such knowledge increasingly necessary.

Hydraulics is studied from the theoretical and the applied side. The laws of gravity as affecting the flow of water, the formulae of flow through orifices, over weirs, in pipes, and their application to varied conditions and to the measurement of water. Two terms are given to this. A special apparatus has been constructed for experiment, and in addition means of rating current meters, long pipe for determining the loss of head, etc., are available.

Agricultural Hydraulics.—In this study the relation of water to plants is considered, the amount of water used, the most favorable amount of moisture to be desired, the methods of irrigation, etc. The agricultural applications needed by the engineer, and the engineering relations needed by the farmer are here considered.

Irrigation engineering more particularly considers the principles to be followed in construction of irrigation works. This is supplemented by the large collection of plans and photographs, and the structures within easy reach.

A practical phase of the engineer which is bound to develop more is covered in the course in *Canal Management*, more especially intended to give the results of experience in Canal Management as it has been developed, and similarly a course of instruction is given in the laws of irrigation and their development.

The characteristics of materials used in engineering, a study of their strength, of the mechanics of stresses, and some study of the various materials as well as laboratory practice with a testing machine of 50,000 pounds capacity and a special cement testing machine are taken up during the Junior year.

The principle of *trusses* is also considered in the Junior year. This is taken in full enough detail to give the student a knowledge of the laws, and an ability to compute the simpler forms of trusses.

Photography has proved one of the most useful aids to the work of the engineer, in keeping records of work done, in taking notes, and in many important ways, so that each student is required to familiarize himself with the principles, and sufficient practice to make creditable photographs.

The important subject of *Dams*, a consideration of the principles, methods of construction, a study of the failures as indicating mistakes and what to avoid; of *concrete and water supply* are given due attention. *Engineering design*, including the planning of actual works, is taken up in the Senior year. The student is given a practical problem, is expected to work out the details, make the design and estimate. This may be done in connection with the thesis. Some valuable work has been done in this connection.

Further attention is given to the business side of engineering, especially in the discussion of *specifications and contracts*. Every engineer, as indeed every citizen, needs to be somewhat of a business man. The characteristics of written and implied contracts are studied, as well as the principles of specifications.

Other branches necessary to the training of an engineer are included in the Senior year. Among them are *road engineering and road making*, *City engineering*, and other general problems of engineering.

Throughout the last two years of the course, the students in the upper classes use one hour per week for the consideration of selected topics on engineering matters, and the consideration of articles in the current technical papers and magazines, with which the library is well supplied. The students are encouraged to read current technical literature.

Thesis.—Before graduation each student is expected to prepare a thesis on some subject of engineering, selected with the approval of the Professor of Engineering. This subject is one which is intended to involve careful study and investigation, and the comparison of data.

The Library.—The general library contains about 25,000 volumes, and 15,000 pamphlets. The Department Library contains a large number of books on subjects relating to engineering, and an unusually large collection of works relating to irrigation and irrigation engineering.

Degrees.—At the completion of the course the degree of Bachelor of Science is given, and for two years' subsequent work the degree of Civil Engineer may be obtained. This must show experience in engineering work by the applicant.

The students have various literary and other societies. They publish a College paper, and have many clubs.

Society.—The students of the Engineering courses have united in forming an Engineering Society. This meets every two weeks and discusses matters relating to engineering. This has proven very profitable to all concerned. The class room is provided with stereopticon and reflectoscope, so that lantern slides, photographs and other pictures can be projected for demonstration.

Speakers from outside occasionally address the students. More of a feature will be made of this in the future than has been in the

past. These have included men of eminence in the line of engineering and construction, and specially some of our own graduates.

Military Drill.—Drill is required of students during the first three years. This is most excellent physical training, and is under the direction of a United States retired Army officer.

Expenses.—There is no charge for tuition. Expenses are low. They consist of \$4.00 general College fee for each year. The College has no dormitories. Board is obtained at from \$2.75 in clubs to \$3.50 to \$4.00 per week in private boarding places. Double rooms cost from \$6.00 to \$12.00 per month. The cost of books varies in the different terms, from \$5.00 to \$8.00 per term. Other expenses vary with the student. Some students earn money during their College course, but any great amount of energy expended in this way may be a detriment to the quality of his school work. It is a heavy strain to earn a living and get an education at the same time.



Rich Crops, Ample Yields, and Wealth as Final Result.

COURSE OF STUDY CIVIL AND IRRIGATION ENGINEERING

FRESHMAN YEAR.

FALL TERM.

Forenoons.	Afternoons.
College Algebra, 5.	Laboratories and Field Work.
Rhetoric, 5.	
Carpentry and Joinery, 2.	Shop (Wood Work), 10.
Drawing, 3.	

WINTER TERM.

Trigonometry, 5.	
Rhetoric, 5.	Shop (Forge Work), 10.
Descriptive Geometry, 3.	
Drafting, 2.	

SPRING TERM.

Analytical Geometry, 5.	
English Literature, 5.	$\frac{1}{2}$ Drafting, 10.
Surveying, 5.	$\frac{1}{2}$ Surveying, 10.

The figures indicate the hours per week in the class or laboratory.

SOPHOMORE YEAR.

FALL TERM.

Forenoons.	Afternoons.
Field Camp, two weeks (before opening of Fall Term.)	
Differential Calculus, 5.	$\frac{1}{2}$ Field Work, 10.
Physics (Mechanics), 5.	
Higher Surveying, 3.	$\frac{1}{2}$ Physical Laboratory, 10.
Photography, 2.	

WINTER TERM.

Integral Calculus, 5.	
Physics, 5.	Physical Laboratory, 10.
Chemistry, 5.	

SPRING TERM.

Chemistry, 5.	
Irrigation Engineering, 3.	
Agricultural Hydraulics, 2.	Chemical Laboratory, 10.
English, 2.	
Drawing, 2.	

JUNIOR YEAR.

FALL TERM.

Forenoons.		Afternoons.
Field Camp, two weeks (before opening of Fall Term. Practice).	Transit	Hydraulics Lab., 4—2. Surveying, 6—3.
French or Spanish, 5.		
Hydraulics, 5.		
Strength of Materials, 5.		

WINTER TERM.

Hydraulics, 3.	
French or Spanish, 5.	
R. R. Surveying, 3.	$\frac{1}{2}$ Drafting, 10—5.
Materials of Engineering, 2.	$\frac{1}{2}$ Testing Lab. 10—5.
Irrigation Law, 3.	
Seminar, 1.	

SPRING TERM.

Roofs and Bridges, 5.	
Geology and Mineralogy, 5.	Field Work, 10—5.
French or Spanish, 5.	
Seminar, 1.	

SENIOR YEAR.

FALL TERM.

Forenoons.		Afternoons.
Field Camp, two weeks (before opening of Fall Term).		
Logic, 3.		
Electricity, applied, 5.		Elec. Lab. 6—3.
Seminar, 1.		Engineering Lab. 4—2.
Meteorology, 2.		
Dams, 2.		
Drafting, 2 (2 hours.)		

WINTER TERM.

Concrete Foundations, 5.	
Water Supply, 3.	
Canal Management, 1.	
Engineering Design, 1.	Engineering Design, 10—5.
Political Economy, 3.	
Laws of Contracts, 1; Specifications, 1.	
Seminar, 1.	

SPRING TERM.

Thesis, 5.	
Roads, $\frac{1}{2}$ —5.	
Civil Engineering, $\frac{1}{2}$ —5.	Special Engineering Work, 10—5.
Engineering, Design, 1.	
Seminar, 1.	
Constitution of U. S., 4.	

The work of the course is to be judged by the work of its graduates. The classes have not been large, but the number of graduates successfully following engineering is too large to give space to. A few only will be mentioned. These show the various lines in which they have been successful:

- 1892. C. W. Beach, in charge of river records and surveys for the Great Plains Storage Co., Lamar, from Twin Lakes to the State line, 1896-1904; practicing engineer Arkansas Valley, in charge of considerable construction; Deputy State Engineer, 1905.
- 1892. Frank Beach, Professor of Agriculture and Irrigation Engineering, Montana Agricultural College; County Surveyor, Las Animas; Engineer, Fort Collins.
- 1892. L. L. Stimson, Irrigation Engineer, Greeley; County Surveyor, City Engineer, Greeley. Constructed many of the large reservoirs in Northern Colorado, the Jumbo, Empire, etc.
- 1892. Porter J. Preston, from Longmont. In charge of Canal rating and river gaging, State Engineer's office, 1893-'96; Engineer Pawnee Pass Reservoir Co.; in charge of river service in the Arkansas Valley; Construction Engineer, Fort Lyons Canal enlargement; Superintendent of the Fort Lyon Canal (110 miles long), for several years. Deputy State Engineer, 1903-'05. In charge reservoir construction, Lewiston, Idaho, 1905-'7.
- 1893. J. D. Bloomfield, from Meeker. Irrigation Engineer, Greeley. Organizing and making a financial success of the Phyllis Canal, Nampa, Idaho, 1894-1904; Cashier of the newly organized Citizens' State Bank, Nampa, Idaho.
- 1893. Samuel L. Boothroyd, from Fort Collins. Assistant Astronomer Lowell Observatory, Flagstaff, Arizona; Assistant in Mechanics, Cornell University, Ithica, N. Y.; Summers in charge of a party in the International Boundary Survey between Alaska and Canada.
- 1893. Ray F. Walter, Fort Collins. Irrigation Engineer, Greeley; County Surveyor, City Engineer, Greeley. Constructed many ditches and reservoirs; Engineer Reclamation Service, 1902; now Division Engineer in charge of and responsible for all surveys and construction of the Belle Fourche Project, South Dakota.
- 1895. J. B. Balcomb. Practicing Mineral Surveyor in Colorado; Engineer of various mines and in charge of various hydraulic constructions and mining work in Palo Alto, California; now General Manager Hudson River Concrete Co., Brooklyn, N. Y.
- 1895. L. B. Curtis, Denver. For several years Assistant Engineer of the Denver Tramway Co.; Engineer on hydraulic projects, including New Century Mining Company, at Gore Canon; Construction Engineer of 115-mile power transmission plant, from California to the Mining Camps of Nevada, making a record in construction.
- 1896. R. W. Hawley, Fort Collins. Assistant Superintendent Nampa Canal, Idaho; Assistant Engineer of the Western Homestead Co., Albuquerque, N. M.; Assistant Irrigation Engineer for gaging in the Arkansas Valley for the Colorado Experiment Station; Gauger for the State Engineer's office, Denver; on Topographic Survey in the Government Service; Superintendent of the Carson Sink Canal; now in Washington.

1898. Amos Jones, Canon City. Assistant Engineer Crystal River Railway; Assistant in Engineering, Agricultural College; in Reclamation Service as Topographer; Special Deputy from State Engineer's office in charge of Arkansas River distribution 1903-'04; Civil Engineer, Stockton, California.
1898. C. E. Swan. Has been connected with the Engineering Department of the U. P. Coal Company, Rock Springs, Wyo., from a short time after graduation. Now principal Assistant Engineer and has charge of the surveys of many mines in Wyoming and Colorado.
1898. M. D. Williams, Victor. Assistant Engineer West Gallatin Irrigation Co., Montana; on the Short Line R. R. Survey; Pike's Peak Power Co.; U. S. Reclamation Service, Arizona and Oregon; Irrigation Engineer, Klamath Falls, Oregon.
1900. E. C. McAnelly, Fort Collins, County Surveyor of Larimer County; City Engineer of Fort Collins. Constructed the Scenic Road up the Big Thompson Canon to Estes Park; also the Fort Collins Water Works, costing over \$200,000.
1901. James H. Andrews, Fort Collins. Student at Columbia University. In charge of the location surveys on the Grand River Canal at Lulu Pass; of the trestle and sewer work for the Great Western Sugar Company at Fort Collins in 1905; in charge of extensive railway improvements on the C. & S. R. R. between Fort Collins and Longmont; Engineer of the Water Supply & Storage Company, Fort Collins.
1901. A. Jacob, Antonito. On the Engineering force of the Great Plains Co., at Lamar; Assistant in the State Engineer's office 1904; Central City Power Co., Colorado Springs.
1902. Oro McDermith. Assistant in the U. S. Reclamation Service; in charge of one heading of the Gunnison Tunnel, Montrose, Colo.
1902. R. E. Richardson. Assistant Engineer on the construction of Lake Reservoir for the C. F. & I. Co., at Leadville; Engineer, Delta; Surveyor and practicing Engineer, Longmont.
1902. Harry True, Nepesta. Assistant in stream measurement in State Engineer's office, Denver; Assistant Engineer Panama Canal, under Civil Service in 1905-'06; Practicing Engineer, Fort Collins.
1903. W. A. Lamb. Assistant in gaging for the Experiment Station; Assistant in stream gaging U. S. Reclamation Service in north-western Colorado; now connected with the U. S. Reclamation Service, Oklahoma.
1904. Ralph Parshall, Golden. Instructor in the Agricultural College; charge of a railroad now constructed in the Arkansas Valley; in charge of the students' Field Camp in 1905 and 1906.
1904. Howard Sneddon, Salida. In charge of gaging on the upper Arkansas River for the Consulting Engineer for Colorado in the Kansas-Colorado suit; now a Railroad Engineer in New Mexico.
1906. J. C. Counter, Brighton. On Surveys of Reservoirs near Julesburg, Colo. Engineer for the North Poudre Irrigation Co., Fort Collins.
1906. George M. Neel, Greeley. Assistant Engineer Central Colorado Power Co., Colorado Springs.
1906. Littell Snively. Engineer for the North Poudre Irrigation Co., Fort Collins and Wellington. Appointed Assistant Engineer U. S. Government, under Civil Service, October 1906, for service in the Philippine Islands.

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Agricultural College Bulletin.

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JANUARY, 1907

The Fruit Growers Short Course at Delta.



HORTICULTURAL BUILDING

The Course in Horticulture at the Agricultural College Fort Collins, Colorado.

Published by The State Agricultural College,
Fort Collins, Colorado.

Faculty of Horticulture and Entomology.

W. PADDOCK.....	Horticulture and Botany
B. O. LONGYEAR.....	Botanist
E. R. BENNETT.....	Potato Investigations
L. F. PAULL.....	Horticulturist
L. M. MONTGOMERY.....	Gardner
O. B. WHIPPLE.....	Horticulturist, Western Slope Fruit Investigations

C. P. GILLETTE.....	Entomologist and Zoologist
S. A. JOHNSON.....	First Assistant
L. C. BRAGG	Curator
MISS M. PALMER.....	Artist
E. P. TAYLOR.....	Entomologist, Western Slope Fruit Investigations

FRUIT GROWERS' SHORT COURSE.

By the State Agricultural College, Held at Delta, Colorado, January, 1907.

The short course in horticulture for fruit growers, which was recently held at Delta, has attracted favorable comment, not only because it was a successful meeting, but for this State, at least, it was a novel undertaking. It is likely that this movement will be extended in the near future, not only to the fruit growers in other localities, but to other agricultural industries as well.

A brief account of the school should, then, be of general interest, and perhaps of value, particularly to farmers, stockmen or fruit growers, who may be interested in securing a similar school for their locality.

Like many of the western states, Colorado is so large as to be unwieldy in many respects. Distances are great and travel is expensive. The agricultural College is located on the eastern slope of the mountains and to the north, while the more important fruit sections are on the western slope. Taking all of these things into consideration, it hardly seems probable that a short course for fruit growers would be very generally attended if held at the college. It was, therefore, thought that an effort to take the college to the people would be much more feasible.

With this idea in view, the statement was made at several meetings of fruit growers, that if any locality would guarantee an attendance of fifty men the college would undertake to give them a course in horticulture, of one week's duration.

The town of Delta alone took hold of the idea and pushed it through to a successful termination. The required guarantee of attendance had the desired effect, in that it made the school their school and its success or failure theirs. So the Chamber of Commerce, together with some of the more prominent fruit growers, under the direction of Mr. W. P. Dale, began a systematic advertising campaign, and in a short time committees had a list of one hundred fruit growers who had expressed a willingness and a de-

sire to attend the course. The advertising was continued throughout the season by notices published in the county papers, by printed matter sent through the mail to a large list of fruit growers and by personal solicitation.

Later in the season a course in Domestic Science for fruit growers' wives was announced, which was to be given at the same time.

On the part of the college such a departure was in the line of an experiment, so time and expense were not limited in the effort to make this initial attempt a success. A program was made out



Students, Fruit Growers' Short Course, Delta, 1907.

along the lines suggested by a fairly good understanding of the conditions existing in Delta County. A study of insects and insect remedies is at present perhaps of first importance, while the principles of horticulture are always in demand. These were the main topics, but other subjects which are of interest to fruit growers were not neglected, and were interspersed so as to lend variety.

The school opened on the morning of January 14, at nine o'clock, with about seventy-five men enrolled. This number was soon increased to one hundred and twelve, the total enrollment, but

a great many transients came and went, of whom no account was taken.

The entire week was marked by a spirit of interest, enthusiasm and good nature which the writer has never seen equaled. All were imbued with the idea that the school was to be a success from the start, and this attitude undoubtedly had much to do with making it such.

The citizens of Delta were on the alert at all times to assist, and too much credit can not be given them. The merchants donated a fine lot of prizes for an exhibit of apples, and the display, though not large, has been seldom equaled in quality.



Demonstration of Power Sprayer. Fruit Growers' Short Course, Delta, 1907.

The women's course under the management of Miss Ammons, Dean of Women, at the college, was equally successful. Seventy-five women enrolled for a part or all of the course. Two half days were devoted to high school students and about eighty boys and girls availed themselves of the opportunity.

Popular lectures and a reception occupied the evenings. These lectures, while of an educational nature, were given more as entertainments, to which all were invited, and crowded houses greeted each speaker.

The majority of persons attending the course were fruit growers, but general farmers and stockmen were well represented. However, men engaged in other lines of business were interested listeners, such as merchants, lawyers, doctors, preachers, railroad men and real estate men.

As is usually the case, successful orchard men more generally attended the course than others. Men who have received eight and ten hundred dollars gross from an acre of apple orchard were heard to say that the instruction meant the saving of a great many dollars to them. One man who is developing a number of orchards, intends to send his men to the school next year and to pay all their expenses, believing that the knowledge they will thus gain will repay him many times. A movement is already on foot to make the school at Delta a permanent annual event, and the people in charge have set the date for the next school at ten o'clock, Monday morning, January 13, 1908.

Other localities are also working for a short course in horticulture for next winter, and it is to be hoped that the college funds available will be sufficient to greatly extend this work.

A tuition of two dollars will be charged next season, but the money derived from this source will not be sufficient to cover expenses. This only emphasizes the desirability of having a strong local horticultural society with money in its treasury, so that when the time comes to make a move in a desirable direction, lack of funds will not hinder.

A list of the corps of instructors, together with the program of the short course in horticulture held at Delta, is given below:

INSTRUCTORS.

DR. S. W. FLETCHER.	}	
W. PADDOCK.....	}	Horticulture
O. B. WHIPPLE.....	}	
C. P. GILLETTE.....	}	Entomology
E. P. TAYLOR.....	}	
E. DOUGLASS.....		Chemistry
W. H. OLIN.....		Agronomy
L. G. CARPENTER.....	}	Irrigation
W. R. THOMAS.....	}	
H. M. COTTRELL.....		Animal Industry
MISS T. G. AMMONS...	}	Women's Course
MISS E. M. NEFF.....	}	

EVENING LECTURES.

DR. B. O. AYLESWORTH
 COL. J. F. TUTTLE, Jr.
 MISS AMMONS, Dean of Women
 DR. W. R. THOMAS

FRUIT GROWERS' SHORT COURSE.

By the State Agricultural College, to be held at Delta, Colorado, beginning January 14, and
Ending January 19, 1907,

SCHEDULE.

MONDAY.

- 9:00-10:00—Opening and Organization.
- 10:00-11:00—Structure and Habits of Insects.
- 11:00-12:00—The Orchard Plant—What It Is, Its Nourishment and Growth.
- 1:30- 2:30—Plant Food.
- 2:30- 3:30—Planning the Orchard—Location, Site and Soil.
- 3:30- 4:30—Insect Remedies in General.
- 7:30—Lecture, Dr. Aylesworth.

TUESDAY.

- 9:00-10:00—Stocks, Cions and Propagation.
- 10:00-11:00—Seed Selection.
- 11:00-12:00—Soils.
- 1:30- 2:30—Selection and Inspection of Nursery Trees.
- 2:30- 3:30—Sugar Beets.
- 3:30- 4:30—Plant Lice
- 7:30—Lecture, Col. Tuttle.

WEDNESDAY.

- 9:00-10:00—Planting the Orchard—Pruning and Care for Four Years.
- 10:00-11:00—Forage and Feed Crops.
- 11:00-12:00—Maintenance of Soil Fertility.
- 1:30- 2:30—Scale Insects.
- 2:30- 3:30—Cultivation and Its Substitutes—Fertilizers and Cover Crops.
- 3:30- 4:30—Brown Mite and Red Spider.
- 7:30—Lecture, Miss Ammons.

THURSDAY.

- 9:00-10:00—Chemistry and Insecticides.
- 10:00-11:00—Borers.
- 11:00-12:00—A Study of Buds.
- 1:30- 2:30—Grasshoppers and Cut Worms.
- 2:30- 3:30—Pruning of Bearing Trees.
- 3:30- 4:30—Principles of Irrigation.
- 7:30—Reception.

FRIDAY.

- 9:00-10:00—Diseases of Fruit Trees and Their Control.
- 10:00-11:00—Seepage, Prevention and Cure.
- 11:00-12:00—Pear Blight.
- 1:30- 2:30—Judging Fruit.
- 2:30- 4:30—Spraying Mixtures. Practicum.
- 7:30—Lecture, Dr. Thomas.

SATURDAY.

- 9:00-10:00—Habits and Life History of Codling Moth.
- 10:00-11:00—Irrigation Institutions.
- 11:00-12:00—Remedies for Codling Moth.
- 1:30- 4:30—Field Demonstrations with Spraying Machinery.

The Course in Horticulture and Botany at the Agricultural College.

Horticulture.—There is in Colorado an evergrowing demand for trained horticulturists, that is, for men who understand the underlying principles of plant growth, especially as applied to fruit growing. Other lines of horticulture have not yet come to occupy a prominent position in the industrial interests of the state, as doubtless they will sometime.

We have endeavored to shape our course, not to turn out full-



Laboratory Work in Propagation. Juniors.

fledged, practical fruit growers, which would be impossible, but to meet the above demand by turning out men with the kind of knowledge which will make them, for example, expert fruit growers or gardeners in the shortest possible time—much shorter and better than had they not taken it.

Structural details, plant relationships and the general knowledge of the plant kingdom in various phases is secured through the work in botany elsewhere outlined. This knowledge is then applied in a term's work dealing with the general culture of plants, their

methods of propagation, their soil, water and other relations, and the control of their enemies. It is intended to accompany this with as much practical work as possible in budding, grafting, pruning, making of spraying mixtures, etc.

Having learned in a general and practical way how plants are handled in the greenhouse and in the field, the student is next taught why these methods are necessary, i. e., the physiological processes of the plant upon which successful practical methods of plant culture depend.



Laboratory Work in Grafting.—Juniors.

Following now into the special lines of horticultural work the student may take up the study of fruit-growing, as such. He studies the theories and practices of past and present, paying especial attention to the demands of Colorado conditions. He studies the varieties so far as possible at first hand, learning the points which serve to distinguish them, and judging the differences between grades of fruit. Visiting orchards, he learns to apply the principles and thus to distinguish by the effects between good and bad orchard practice.

During his senior year he undertakes some practical experiments, the details, results and conclusions of which he incorporates into a graduating thesis. Accompanying this he is given a course

in reading with occasional meetings of the entire class in order that various problems may be freely discussed, and that each student may be kept in touch with the work the others are doing. He may also elect during his senior year certain special lines of work, according to his interests and tastes.

One of these subjects is Landscape Gardening. Starting with a survey of the history and principles involved, he proceeds to study the laying out of grounds, especially the home grounds, and the arrangement of lawns, shrubbery, etc. Attention is also given to plant materials and their effective use and ornamental value.

If the student be interested more especially in the growing of vegetables or of flowering plants, for sale, he may pursue a course dealing with the construction, heating and general management of greenhouses, hot-beds, etc., the transplanting of plants grown therein to the open ground, the methods employed in vegetable gardening, etc. Further, if he be interested in the improvement of existing plants, the methods by which cultivated plants have arrived at their present stage of development and the fundamental philosophy upon which such methods are based, he may elect a course in Plant Breeding and Evolution. In connection with this he will have actual practice in the technique of hybridization.

Any student who shall have satisfactorily completed this work, together with other lines of work required or recommended, will be at graduation not only well trained in horticultural lines, but will also possess a well rounded education in lines best calculated to make him a sound and able citizen.

Botany.—Agriculture deals primarily with three things, the soil, plants and animals. Now as plants are the only living things which are able to make use of the elements of the soil and air as food materials, all other living things are dependent on them for subsistence. A knowledge of botany, which deals with the structure and life processes of plants, is therefore fundamental in an agricultural education.

The botany best adapted to the needs of the agriculturist is not quite the same as that which is usually given in a University course. Thus while some attention is given to the study of the lower forms of plant life and the theories of the development of the higher plants, the emphasis is placed on giving the student such knowledge of plants as will furnish an understanding of their life processes and

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Colorado State Agricultural College.



Live Stock Pavilion.

Second Annual Announcement
of the

Short Course in Agriculture and Domestic Science.

Published by The State Agricultural College,
Fort Collins, Colorado.

1907.
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Officers and Instructors.

THE PRESIDENT OF THE COLLEGE.

THE DEAN OF AGRICULTURE.

THE DEAN OF WOMEN.

Prof. W. L. Carlyle, Animal Breeding, Care and Management of Live Stock.

Dr. Geo. H. Glover, Veterinary Science, Animal Diseases and Bacteriology.

Dr. Wm. P. Headden, Agricultural Chemistry.

Prof. C. P. Gillette, Entomology, Physiology and Hygiene.

Prof. Wendell Paddock, Plant Life, Horticulture and Gardening.

Prof. W. H. Olin, Farm Crops, Farm Management and Soil Fertility.

Prof. H. M. Cottrell, Breeds, Feeds and Feeding, and Judging of Live Stock.

Prof. Theodosia G. Ammons, Home Science.

Prof. H. M. Bainer, Farm Engineering and Practical Irrigation.

Miss Lottie Crawford, Instructor in Cookery.

Miss Margaret Prendergast, Instructor in Sewing.

C. G. Dwyre, Farm Bookkeeping and Accounts.

S. A. Johnson, Assistant in Entomology.

B. O. Longyear, Assistant in Plant Life and Horticulture.

F. C. Alford, Assistant in Chemistry.

Earl Douglass, Assistant in Chemistry.

Fritz Knorr, Assistant in Agronomy.

Dr. I. E. Newsom, Assistant in Veterinary Science.

*—————, Farm Dairying, Butter Making and Milk Testing.

*To be assigned.

Announcement.

The Short Course in Agriculture is offered at this time to supply the demands of young men and women who are ambitious to excel in their life work along agricultural lines, and who feel the need of more education and scientific training in their chosen calling. The time which such persons can devote to study in colleges is often limited, and the preparation necessary for a college course, in a great many instances, has not been acquired by the boys and girls on the farm. For these reasons the selection of topics and the arrangement of studies, laboratory work, judging exercises, etc., have been planned to give the greatest amount of knowledge and training possible in the shortest time. The subjects chosen for the course are those about which every young man and woman associated with farm life should have definite and clear knowledge and training. In their discussion the subjects are treated in such a manner as to make the information obtained most helpful to the student.

There is no longer any question concerning the value of advanced and accurate knowledge bearing on successful agricultural practices to those who follow farming, stock raising and home making as a business. Education and training pay on the farm and in the home as they pay in any other calling in life. Experience has enabled us to plan buildings, secure instructors and apparatus, and arrange a course of study so intensely practical and helpful in its character that we believe the ambitious young men and women who carefully consider the matter presented in this circular will not debate whether they can afford to take the course or not, but rather whether they can afford to miss the advantages presented by taking such a course. The expenses connected with the course are very small indeed when the advantages offered are considered, and any energetic young man or woman, no matter how limited their resources, can secure the funds necessary to enable them to take the course. The students attend in the winter months when the farming work is least pressing usually, and the money necessary to meet the expenses of the session can be earned in a single summer at farm labor by any ambitious young person.

The College of Agriculture is maintained in part by the State, and in part by the United States Government. The fees paid by students constitute an exceedingly small portion of the total outlay. The special aim and object of the College of Agriculture is to build up, in the State of Colorado, the farming interests in all branches, and to make those living on the farms more intelligent and useful citizens.



Agricultural Hall.

Course of Study.

Judging, Breeds, Animal Breeding and Feeding, Care and Management of Live Stock.

PROF. W. L. CARLYLE AND PROF. J. A. MCLEAN.

Assistants: A. L. Hutchings and James Hutton.

The course of study embraces 30 lectures to each class, besides a vast amount of practice work in the judging, feeding, care and management of live stock in the live stock class room and stables; also a study of pedigrees of live stock. The lectures provided for the first year students will treat largely of the origin, history, characteristics and utility of the various types and breeds of horses, cattle, sheep and swine. Special attention is given to the characteristics and utility of those breeds and types which have proven well adapted to existing Colorado conditions. A large, well lighted and well equipped live stock class room is under process of construction and will be ready for the classes when they enter. This will prove very valuable in training the students in the selection and judging of live stock.

First year students use score cards to acquire the necessary practice on typical animals to fix in their minds the value of a perfect development of the various parts or points of the animal. Through this practice in scoring animals, supplemented by lectures bearing on the different qualifications of the various animals scored, the students secure the initial training necessary to fit them for judging animals in group competition later. The general plan of the first year course is to thoroughly acquaint the student not only with the perfect types of the several breeds, but also the types of various market classes of live stock as a preparation for the work of the second year, which naturally follows.

The second-year lectures on breeding include the principles, methods and practices of breeding. This work is supplemented and brought home to the students by having them tabulate pedigrees from herd and flock books, which serves to illustrate graphically the lines of breeding followed in the evolution of some of the highest types in the various breeds of live stock. In discussing the principles of breeding, heredity, atavism, variation and allied topics are presented, while in considering the methods of breeding, such topics as in-breeding, line-breeding and balance-breeding are discussed.

Attention is given to competitive or show-ring judging. The classification of stock adopted by our leading fairs is followed so far as possible. A number of animals are led into the class room and the students are directed to place them in their order of merit, writing out concisely their reasons for placing one animal ahead of another in competition.

In the study of feeds and feeding, the student will receive instruction in the composition and value of the various feeding stuffs as found in plant and animal substances, and their relation to the



Carmon, Head of the U. S. Government Breeding Studs.

growth, development and fattening of the various classes of live stock. Each of the different crops grown on the farms and ranches of Colorado will be discussed from the stockman's standpoint, and their weak and strong points noted. The importance of these subjects of successful farming or ranching will never be lost sight of in this course of study, since it forms the basis for continued prosperity in agricultural communities. Consequently, great care is exercised in advancing the student's knowledge and in increasing

his interest in everything relating to the improvement and welfare of the animals on the farms and ranches. The aim of this course in feeds and feeding is to so aid and instruct the student in the principles underlying the nutrition of farm animals that upon finishing his course he will be able to join the ranks of the most up-to-date stockmen of this State and to practice successfully the science of stock raising and feeding.

Second-year students will also be given practical instruction at the stables in the care and management of the different classes of stock, a certain number of students being required to work in the barns by turns, one or two hours each day. Each student is re-



Jolie Johanna and Her Calf.

Grand Champion Holstein Cow of St. Louis Exposition.
Property of The Colorado Agricultural College.

quired to become proficient in taking the temperature, respiration and pulse of the various classes of live stock. They are also given valuable instruction in the care and nursing of sick animals, such as making and applying poultices, bandages, etc. Grooming, blanketing, fitting and trimming stock in a manner similar to that practiced by breeders when preparing for a show or sale, is taught

by experts in this line. The practical feeding and management of dairy cows, sheep, swine and horses is demonstrated in the barns, each student being required to assist in such work. The aim in this course is to help the student become a thoroughly practical and expert stock man.

Farm Dairying.

The course in farm dairying includes both lectures and practice in this very important line of agricultural effort. Instruction in the feeding, care and management of dairy cattle, the production of milk, the testing of milk and the making of butter, will be discussed and practice work given. A large room is being equipped with all of the latest machinery and facilities for this work. The apparatus will include the most modern hand cream separators now used on our farms, as well as the various testing machines, churns and utensils generally. The instruction includes lectures on the care of milk, its separation, the construction of separators and practice of putting them together and studying the different parts of each machine. A supply of milk will be provided and each student will be required to use the different separators and become familiar with the various manipulations which control the separation of cream from milk, the thoroughness of skimming, the regulation of thickness of cream, etc. The cream obtained from operating these separators is ripened and prepared for churning by the students, thorough instruction being given in all the details. The butter is churned and worked with apparatus that is most successfully used in farm dairy practice. Each student is required to go through the entire operation of butter making from the time the milk is received until the butter is ready for the consumer. In the course in milk testing, hand testers similar to those used by farmers are supplied. Students learn how to test milk and to overcome many of the difficulties commonly experienced by farmers in testing. The entire course in dairying is given with the object of so training the students that they may be able to carry on all the operations of a farm dairy in the most up-to-date manner.

Veterinary Science.

DR. GEORGE H. GLOVER.

Assistant: Dr. I. E. Newsom.

In this course students will be given practical instruction regarding the anatomy and physiology of animals; also the nature,

cause, symptoms and treatment of the more common diseases, and the means by which they may, in many instances, be prevented. It will be the aim and object of the instruction to qualify each student to act as an intelligent, capable nurse of ailing animals and to be able to recognize diseases and to give simple and efficient treatment of ordinary accidents and diseases. During the course, demonstrations will be given from living and dead animals, simple operations will be indicated, method employed in recognizing diseases and in choosing, compounding and administering medicines will be taught. Full instructions will be given in the examination of horses



The Tuberculin Test.

for soundness, and students will be required to pass upon soundness of subjects selected for the purpose.

The information acquired in this course will prove of great value in the breeding, feeding and general management of farm animals, and an excellent preparation for those who intend later to enter a veterinary college. As aids to the work, the College has skeletons of the horse, cow and other domestic animals and a valuable collection of modern veterinary instruments, casting apparatus, drugs, etc. Instruction in this course is given to both first and second-year students.



Class in Bacteriology.

Field Crops, Farm Management and Farm Engineering.

PROF. W. H. OLIN, PROF. H. M. BAINER AND MR. FRITZ KNORR.

Field Crops.

This course consists of lectures and classroom laboratory work with the various field crops of Colorado. The student will be led to make special study of the circumstances influencing the vitality of seeds; methods and time of seeding the different crops; effect of thick and thin seeding on moisture conditions of the soil and the maturing plants; value and importance of careful seed selection; history, culture and economic use and value of the different forage, grain and root crops adapted to Colorado soils and climate. Our altitude and latitude conditions, our methods of irrigation and farming non-irrigated lands make the selection of particular crops adapted to our conditions an essential factor to our success.



Threshing Experimental Grain on the College Farm.

Certain types of grain show good quality and satisfactory yields when grown on the mountain mesas in higher altitudes. Here, also, certain root and forage crops show remarkable adaptability. The crops on our plains at low altitudes have different con-

ditions and changed environments, hence different varieties of the same crops are required.

The soil and climatic conditions, together with the growing habit and use of the plants, must determine the selection of every crop for any section of the State of Colorado. The crop conditions in one section differ so materially from those prevailing in another that we must carefully study the field crops in order to choose those best adapted to our crop conditions and our needs. This makes the matter of variety and seed selection highly important.

The improvement of crops and of special crops adapted to particular regions of Colorado will be considered in this course, and suggestions will be given showing how desirable crops can be rendered more certain and productive.



A Winter Scene

The object of this term's work is to help the farm student to improve both quality and yield in the crops he grows.

Farm Management.

The conditions are so dissimilar in passing from the mountain ranch to the ranch on the plains, the intensely cultivated farm in

an irrigated region to the "dry farming" now being carried on in many sections of Colorado, that it seems important for the farm student, just taking up his work, to know the conditions prevailing in each instance. The ranch methods and farm practices of the best and most successful ranchmen and farmers in this and other States will be studied. Management of large farms and small farms, special farming and mixed farming, with the essentials governing each, will be carefully considered. Methods of laying out the farm, the arrangement of the fields for rotation of crops, systems of records for keeping reports of the crops of the different fields, with suggestions on farm marketing, will be discussed. Different cultural and crop methods under irrigation and semi-arid farming conditions, the housing of farm machinery, methods of



the College.

checking the losses and husbanding the profits will receive attention.

The farmer, as well as the business man in any other calling or profession, must have a clear grasp of the situation, intellectual equipment, executive ability and business methods if he would succeed in his business.

It is no longer true that "*anybody can farm.*" Farming is a business in which good judgment and skillful management of men, measures the difference between success and failure.

The object of this course is to help young people from the

farm to get a grasp of conditions, to learn from the experience of others and to avail themselves of aids and helps which have proven of value in the management of the ranch and farm.

Farm Mechanics.

Farm Mechanics includes the study of farm machinery, farm building, farm motors, farm fences and gates, and the construction and maintenance of country roads.

The construction, elements of, and operations of the various tillage, seeding and harvesting machinery of the farm will be presented in this course; laboratory work will be given so students will become familiar with these machines and can successfully operate them.

Students will also study the construction, efficiency and durability of farm power machinery, such as gasoline and traction engines, windmills, pumps, feed cutters and grinders, fanning mills.



Farm Mechanics Class in a Plowing Match.

threshing machines, etc. Students will be enabled to determine the relative cost of the different farm motors, and, in managing farms where power machinery must be used, they will be prepared to select that power which will prove the most economical for their conditions.

It is quite important for our farmer youth to be familiar with the arrangement, design, construction and cost of farm buildings: the different kinds of fences, their cost, efficiency and durability, as well as the operating of fence building machinery.

Instruction will be given in planning the various farm buildings, testing strength, durability and value of different building

material, proper arrangements for ventilation and windows for lighting buildings will be studied, together with location of the building site and the arrangement of the farm buildings for convenience and utility.

A study of the location and building of roads leading to the different parts of the farm, the essentials in the construction of country roads and practice in using road machinery will prove quite serviceable to our farm engineering students.

The first year instruction will be given in the construction and operation of various farm machines. This will consist of lectures and demonstration work.

The second-year lectures and class demonstration work will be given in study of farm motors, buildings, fences, gates and farm roads, as outlined above.

The College has over four thousand dollars worth of farm and road machinery, which will be used in class study and field demonstration work in Farm Mechanics.

Plant Life, Horticulture and Gardening.

PROF. WENDELL PADDOCK.

Assistants: B. O. Longyear and E. R. Bennett.

In this course a study is made of the simple processes of plant life so that the student may better understand the conditions which produce certain results. This includes the various phases of propagation, germination of seeds, and the general relation of plants to environment.

The principles of vegetable gardening and floriculture are discussed, particular attention being given to special crops adapted to the numerous localities of the State. The growing of trees, shrubs and flowers for home adornment is also given some attention in the latter part of the term.

A general survey of the horticulture of the State is given in this course. A study of soils and their propagation; the planting and training of trees and choice of varieties; cultivation, pruning and spraying are some of the topics discussed.

Agricultural Chemistry.

DR. WILLIAM P. HEADDEN.

Assistants: F. C. Alford and Earl Douglass.

This course will be given during the first term of the second year, and will embrace the general subjects of soils and soil fertility.

The questions pertaining to the relation of irrigation to the chemical changes which take place in the soil and its general conditions will receive fuller consideration than has heretofore been given to it in our own work. Some of the cultural problems as met with in Colorado will be considered, particularly in regard to the use of green manures.

The general principles of feeding, considered from a chemical standpoint, will be given at the end of the course.

Our object will be to present these subjects in an elementary manner, but, at the same time, to present them fully enough to enable the student to gain a sufficient familiarity with these subjects to profit by the reading of the current literature on feeding, etc.

Injurious Insects, Animal Parasites, Physiology and Hygiene.

PROF. C. P. GILLETTE.

Assistant: S. A. Johnson.

One hour a day during the second term of the second year of the Short Course will be devoted to lectures upon insects. A portion of this time will be spent in a study of the general structure of insects and the methods of classification in the more important groups. This knowledge is important as a basis for a good understanding of the habits of the various species and the remedies that should be used for their destruction, or the prevention of their depredations. The habits and instincts of insects in general will also be given some attention.

Following the general treatment of the subject, we shall take up those species that are of most economic importance in Colorado. Members of the class will be shown specimens of the insects, and, so far as possible, the injuries that they do, and will be told what remedies may be used to prevent damage to crops. The more injurious insects that attack farm, orchard and garden crops, and also the parasites of our domestic animals, will come up for consideration.

There are a great many parasitic and predaceous insects that are very beneficial to man by destroying his insect enemies. The student will be taught to distinguish these from the harmful forms.

The students will also be taught to prepare and apply the various insecticide substances, to test their purity, and to avoid fraudulent or useless preparations.

In the first term of the first year of the Short Course in domestic science and agriculture, a course of lectures will be given in

physiology and hygiene. The plan is to lay special emphasis upon the subject of hygiene, giving only enough of the physiology to enable the student to better understand the laws of health. Among the topics discussed will be the following: Food, Drink, Clothing, Cleanliness, Exercise, Sleep, Rest, Pure Air, Pure Water, Drainage, Sewage and Infectious Diseases. In this course there will be one lecture a day for six weeks.

Farm Bookkeeping and Business Accounts.

C. G. DWYRE.

A course in farm bookkeeping and business accounts will be given to the students in this course. This will be especially helpful to young men who wish to secure a better knowledge of business methods, the aim being to give a course of very practical instruction, training the student in the underlying principles of bookkeeping so that he may be able to keep a systematic set of accounts in connection with any enterprise associated with farming or live stock. A feature of the course will be the discussion of checks, drafts, notes, mortgages and commercial paper in general. Students will be taught to make out inventories and keep separate accounts with each division on the farm.

The Course Co-Educational.

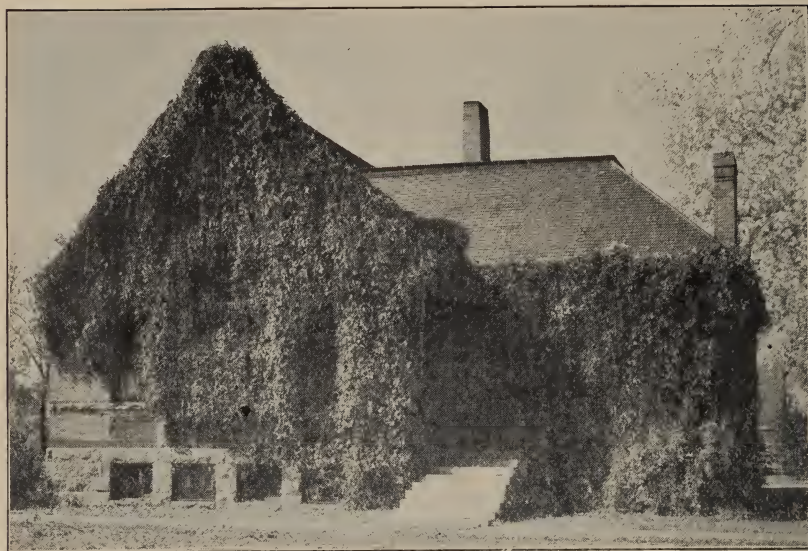
The course is co-educational, all advantages being offered to both sexes alike. The studies are so arranged that while the young men are taking such work as pertains directly to practical farming and stock operations, the young women will receive training in sewing, cooking and such other work in domestic science and home making as will be of the greatest benefit in equipping them for the proper management of their homes. A part of the work, at least, is offered to both boys and girls in the same class.

Domestic Science.

PROF. THEODOSIA G. AMMONS.

Assistants: Miss Margaret Prendergast and Miss Lottie Crawford.

The course in Domestic Science is designed especially for the girls and young women from the farm homes of Colorado. A series



Domestic Science Hall.

of lectures on the various foods, their composition and nutrient value will be a feature of this course; also demonstrations in the proper preparation and cooking of the various vegetables, meats, pastries, etc., will be given. No class of people in the world have equal facilities with those living on the farms for securing the choicest vegetables, meats, etc., and the only reason why their tables are not supplied constantly with the most wholesome and



A

B

(A)—A Loaf of Bread Made from Durum Flour.

(B)—A Loaf of Bread Made from Defiance Flour.

delicate dishes lies in the lack of skill displayed in preparing and cooking the food. This course will also provide instruction in the art of preparing the table and dishes, the proper service and all other matters pertaining to the dining room.

The course in sewing will include lectures and practice work in drafting patterns, cutting out garments, plain sewing, plain and fancy stitching, embroidery and millinery. Special attention is given to the matter of dress and dress making.

The proper furnishing and care of the home will also be a feature of the course. While it is not intended that the young women will be given any extravagant or fanciful ideas as to furni-



Class in Domestic Science.

ture, etc., it is desired that they shall be instructed in the art of making the home a place of joy and comfort.

The instruction given the young women outside of the home making, cooking and sewing departments will include marketing, flower culture, dairying, chemistry, bacteriology, horticulture and the principles of judging, feeding and caring for live stock, particularly horses and dairy cattle. There is no reason why all the women on the farm should not have as much knowledge about the

various types and breeds of horses and of dairy cattle as the men, since they are constantly associated with these two classes of farm stock.

Military Training.

If desired, a company will be formed for military training to be given three times a week. Boys coming from the farms will find these exercises of great value. Precision, promptness, erect carriage, expansion of the chest and control of the arms and legs are some of the benefits to be derived. The young women will receive physical training in the gymnasium.

Equipment and Facilities.

The College is located just outside the city of Fort Collins, in the center of one of the most prosperous agricultural districts in the State. The College buildings are eminently adapted in both class rooms and laboratories for the work of instruction in agriculture. A new and commodious building to be used as a laboratory for farm mechanics is nearing completion, and before the first term opens, a thoroughly modern live stock pavilion, built especially for accommodation of the classes in live stock judging, etc., will be completed. The College farm proper, with the stock barns and stables joins the college campus and comprises some 220 acres. In addition, a beautiful tract of 73 acres of choice land a short distance from the main College farm has recently been purchased, besides a tract of 1,060 acres, all under fence, is utilized as a pasture for stock.

The College library is one of the best, and comprises several thousands of volumes relating to the science of agriculture and general topics, besides several hundreds of stud, flock and herd record books published by the different live stock breeders' associations. These are very valuable for research work in the study of pedigrees and lines of breeding.

The College is now in possession of the finest equipment of the different breeds and types of live stock to be found anywhere in the United States. The location at Fort Collins, in connection with the College and Experiment Station, of the United States Government horse breeding experiment, which now comprises 26 head of the highest type of carriage horses, gives us an equipment and facilities for instruction in this class of live stock that cannot be surpassed in the world. In addition to this splendid equipment

of horses, we have in cattle some of the finest specimens of the various breeds to be found in America or Great Britain. In the beef breeds we have some choice representatives of the Aberdeen Angus, Shorthorn, Hereford and West Highland cattle, including the champion Aberdeen Angus cow of the Highland Agricultural Show of Scotland, and the Shorthorn bull, Hampton's Light, son of the celebrated bull, Merry Hampton, and numerous others of equal merit.

In dairy breeds we have a choice herd of imported Ayshire cattle, a small but exceedingly fine herd of Holsteins, including the Grand Champion Holstein cow of the Universal Exposition at St. Louis, and the first prize and reserve to Grand Champion Holstein bull. We also have a choice young herd of Red Polled cattle, representing the dual purpose type now so popular in many sections.

In the sheep division, we have representatives of four leading breeds, a large proportion of which have been imported, and a number won prizes at the St. Louis exposition.

In the swine department will be found choice specimens of four of the leading breeds, and an excellent opportunity is offered for studying these various breeds and types.

About \$4,000 worth of farm machinery has been secured and excellent facilities are afforded for the course in farm mechanics.

Requirements.

Students must be at least 17 years of age and should have a common school education. No entrance examination is required. Young men at least 20 years of age who have practical knowledge of farming and live stock will receive the most benefit from the work offered to the young men in this course.

Certificates.

Students who complete the studies of the entire two years of the Short Course in a satisfactory manner will receive Short Course Certificates duly signed by the President of the College, the Dean of Agriculture and the Agricultural Faculty.

Expenses.

No tuition is required, but an incidental fee of \$3 will be charged each student for materials used. Board and room can be

secured very readily in homes of citizens of Fort Collins at prices ranging from \$3.50 to \$5 per week. Books should not cost to exceed \$8.00 or \$10.00 for the two years.

Date of Opening.

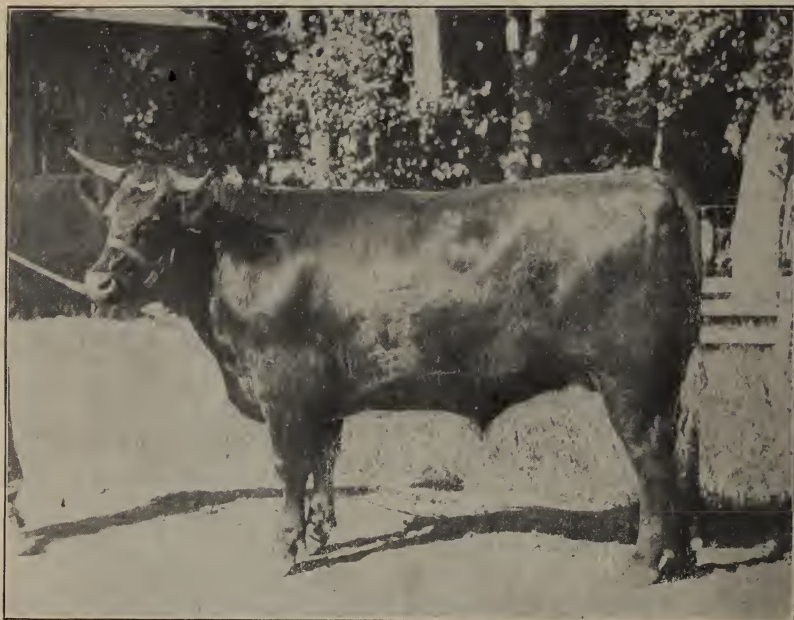
Students will register on Monday, December 3. The term begins on Tuesday, December 4, and will close on Wednesday, March 1, 1907. There will be no intermission between the holidays except that all studies will be dispensed with one day preceding Christmas and New Year, and for one day succeeding each of these days.

For further particulars concerning the Short Course in Agriculture, address,

W. L. CARLYLE,
Dean of Agriculture,
Fort Collins, Colorado.



Agricultural Students in Front of Agricultural Hall.—1906.



Yampa, Champion Steer, Western Live Stock Show, 1906.

A pure bred Shorthorn steer, bred by Cary Bros., Routt County, Colorado. This steer was presented to the Agricultural College when four months old; was fattened and shown by the College at the Western Live Stock Show, Denver, where he was the champion steer, winning in cash prizes \$520, a \$50 silver cup and selling at auction for 33 cents a pound; this being the third highest price ever paid for a steer. The prizes won and money received for Yampa amounted to \$950.

enable him to handle them in a way to secure their highest development.

Students are first induced to exercise their powers of observation in such a way as to acquire the scientific spirit along with independence and resourcefulness in the study of the natural sciences. To this end plants are studied in the laboratory and in the field, making use of such apparatus as is necessary for each course. Text books are used only as works of reference and then only after previous examination of the thing itself. In this way the student acquires his information at first hand and at the same time gains experience and learns how to investigate for himself.

Each student keeps a record of his work by making drawings and notes, which is intended not only as reference matter, but also to develop the habit and best methods of recording his observations.

The subject is begun by a study of the organs of a number of common plants. Seeds and seedlings, roots, stems, and leaves, flowers and fruits are examined, with the aid of simple microscopes when needed, comparing their varied structure, shapes, sizes and uses, together with the changes which they may take on in different surroundings.

In order to acquaint the students with those plants which constitute the crops of the farm, the garden and the orchard, a course in economic botany is given. Actual specimens are studied in connection with a suitable text book for reference. Thus the student studies the most important agricultural plants according to their botanical structure, their natural relationships, and their origin from wild species.

A general knowledge of the plant kingdom as a whole is gained through the study of general morphology. Beginning with the simplest forms of plants a study of the different groups is made following the order which they are believed to have developed toward the highest forms. Thus a general study is made of the pond scums or algae, the molds, mildews and mushrooms, the lichens, the liverworts, mosses and ferns, and lastly the seed plants, using compound microscopes and making drawings of the specimens examined.

In order to fully understand the nature and the workings of the life processes of plants it is necessary for the student to become

familiar with their minute structure. This is accomplished by examination with the compound microscope, using sections of plant organs. Thus the student learns where starch and other food products are stored, their appearance and detection, together with something concerning their formation and uses in the plant. The cellular structure of root, stem, leaf and seed of the higher plants are also studied in order that their workings may be understood. Pen and ink drawings in connection with lectures form the students note book record of the work.

Plants as well as animals are subject to diseases which often prove so destructive that whole crops are sometimes lost or seriously



Laboratory Work in Botany — Sophomores.

injured. Most plant diseases are due to the attacks of various species of microscopic fungi, which are themselves a low form of plant life. The common parasitic funguous diseases of plants are therefore studied in order that the student may not only learn to recognize them but also may be informed as to the best means of preventing and controlling their attacks. The work is conducted by the study of diseased plants with the compound microscope.

For those students who desire to become somewhat familiar with the native plants of Colorado and at the same time gain a knowledge of the principal families of flowering plants a course in

systematic botany is given. Collecting trips are made and the plants thus obtained are used for study and classification, and in addition to this material, specimens from the College herbarium are studied. The student also learns how to prepare specimens for the herbarium by going through the process of drying, mounting and labeling them.

On account of the important relation which the timbered regions of the state bear to our water supply for irrigation purposes, a course in elementary forestry is offered to students in their senior year. In this subject they are taught the influence of forest growth in regulating the spring flow of water, by which forests tend to prevent freshets and lengthen the period of snow melting. The value of forest products in our various industries; conservative lumbering, by which our timber supply is utilized economically; and methods of natural and artificial reforestation are subjects considered in this course.

Finally the student is instructed in the principles which have set aside in this state its vast government forest reserves for the purpose of perpetuating the forests and preventing their needless destruction.

FORESTRY SHORT COURSE.

As this Bulletin goes to press, February 18th, a short course in forestry is in session at the college. This course is to extend through two weeks, and on the fourth day there is an enrollment of 28. This is the first short course in forestry ever held in the United States which is especially designed for forest reserve men, and those who are desirous of becoming forest guards and rangers.

Nearly half of the men in attendance are now in the employ of the United States Forest Service.

In outlining the course especial attention was paid to the practical phases of forest reserve work, such as the making of forest descriptions, estimating and scaling timbers, reading cattle brands and ear marks, methods of natural and artificial reproduction of the forest and protection of the forest from fire, over-grazing, insects and fungi. Members of the college teaching force give nu-

merous lectures upon topics closely related to the work of the forester, such as origin of rocks, soils and commercial minerals; structure of insects and those most injurious to the forest trees; principles of land surveying; fungi most injurious to western forests, and irrigation problems with which forest rangers have to do.

The first half of each day is taken up with lectures and classroom work, while the afternoons are given to practical field work in getting acquainted with native trees; estimating and scaling timber; use of forest instruments; surveying; locating mineral claims and methods of packing and field transportation.

The evening lectures are given by prominent men from the college and from other parts of the state, on irrigation, mining, stock raising, game protection and forestry.

It is the intention to make this short course in forestry an annual feature of the college work and if suitable arrangements can be made, the practical part of the instruction, at least, will be given at a camp in the mountains.

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Agricultural College Bulletin
Issued Quarterly

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NO. 3.

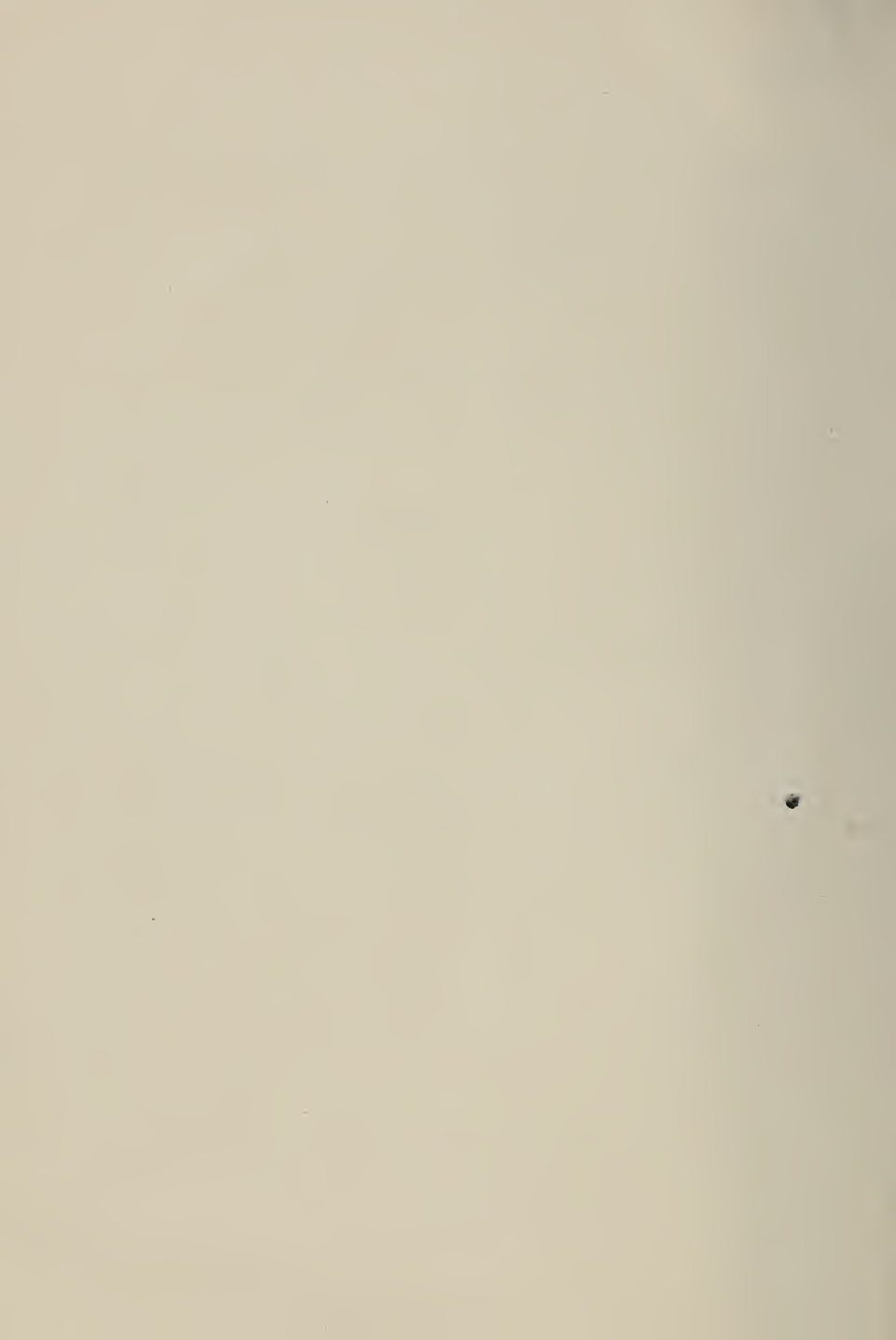
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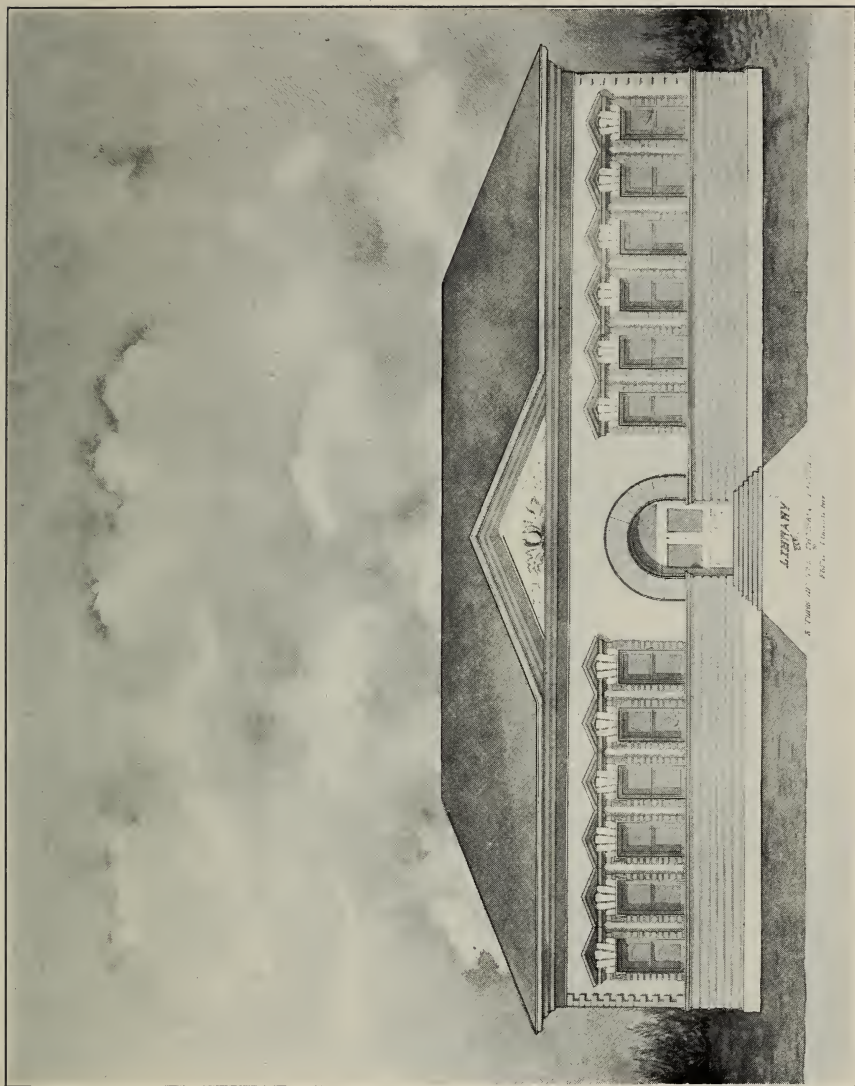
*Circular of the
Department of Architecture*

THE LIBRARY OF THE

JAN 14 1903

*Published by the College, Fort Collins,
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LIBRARY

A Plan of the Library, 1874.
 By Fred Lumberg.

SOUTHMORE DESIGN.
 Fred Lumberg.

ARCHITECTURE.

EDWARD PARKMAN BOYD, B. S.

It was clearly under the provision of all the acts, Federal and State, relating to Agricultural and Mechanical Colleges to provide the youth of the land with such theoretical and technical education as shall make them educated and skilled workmen of high order, that the State Board of Agriculture decided to introduce the following course of Architecture.

The immediate future of Colorado will lay great demands upon young men skilled in making plans for, and superintending the building of artistic and convenient homes and permanent public and commercial buildings.

The aim of this course is to secure to its graduates an ample preparation for the demands of the best professional practice. To that end, its course of study combines thorough professional training with the essentials of a liberal education. Though the graduate will probably practice his profession, should circumstances warrant it, he will find himself peculiarly well prepared for any line of work requiring a broad education and ability to plan for future developments. The course is so framed that the student may acquire thorough skill in draughtsmanship, combined with a critical taste, a creative resource in design and sound judgment in construction.

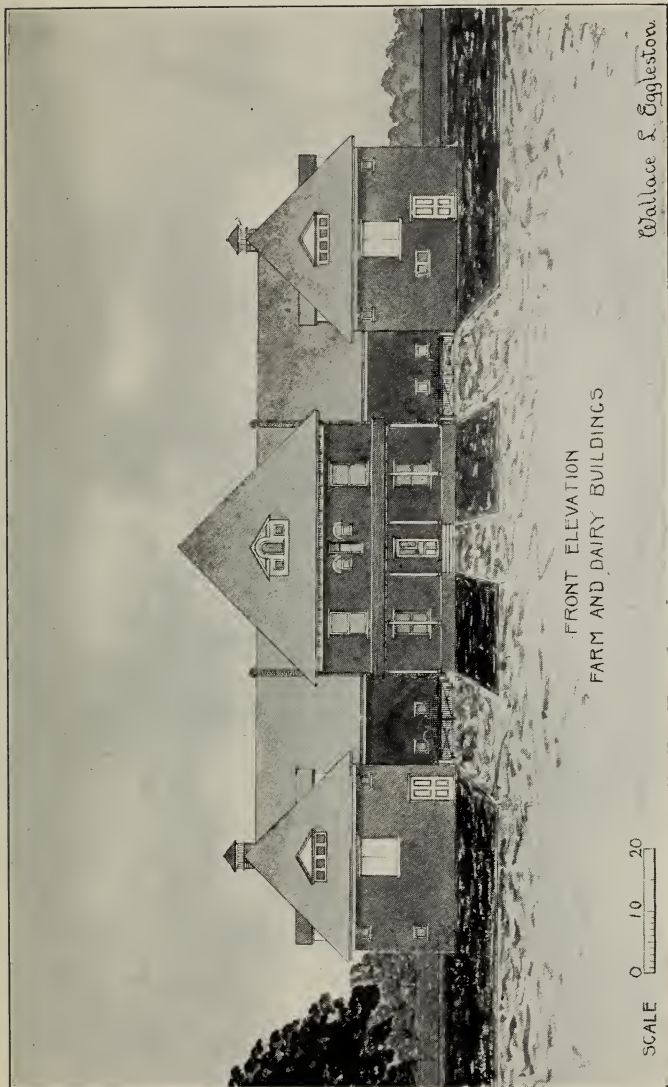
To accomplish these results the course is so arranged as to present Architecture as an art which, while inseparable from sound construction and obedience to utility, yet lies above and beyond these attributes in the field of fine arts. The most important division of the professional work of the department pertains, therefore, to design; and to this subject, in its various phases, the relatively largest portion of the students' time is devoted throughout the course. Careful attention is given to subjects comprehended under the term "architectural engineering," comprising pure and applied science, the nature of materials and the theory and practice of construction and of sanitation.

Draughtsmanship receives constant attention, not only in drawing incident to design, but also in various lines of instruction in pure drawing.

The study of Architecture as here presented, while essential to a proper architectural training, has also strong claims to value as a means of liberal culture, if together with the purely collegiate branches, consideration be given to that basic element in the professional curriculum which pertains especially to the Art of Architecture.

Architectural Engineering, while not a distinct course, is presented in its essentials, the course including all the mathematics, mechanics, etc., usually found in engineering courses. Drawing in its numerous forms is esteemed as a means of cultivating the perceptive faculties, but its great value lies in its peculiar effect in the development of taste, imagination and the faculty of expression, so vital a necessity in creative work.

Realizing the great breadth of architecture, rendered so by the great diversity of uses of buildings, and by the great variety of materials and methods used in their construction, the course of study has been made correspondingly broad. The degree Bachelor of Science is given to those who satisfactorily complete the following prescribed course of study and who present an acceptable thesis.



FRESHMAN DESIGN.
Wallace L. Eggleston.

FRESHMAN YEAR—FALL TERM.

Hours per week.

Algebra -----	5
History of Architecture (Arch. 1.) -----	3
Mechanical Drawing -----	4
Construction (Arch. 11) -----	3

AFTERNOONS.

Elementary Design (Arch. 21) -----	6
Construction Drawing (Arch. 11) -----	4

WINTER TERM.

Trigonometry -----	5
Physics -----	4
Descriptive Geometry -----	3
Construction (Arch. 11) -----	3

AFTERNOONS.

Physical Laboratory $\frac{1}{2}$.	
Construction Drawing (Arch. 11) $\frac{1}{2}$.	

SPRING TERM.

Surveying -----	5
Electricity -----	5
Descriptive Geometry -----	3
Construction (Arch. 11) -----	2

AFTERNOONS.

Surveying $\frac{1}{2}$.	
Physical Laboratory $\frac{1}{2}$.	

SOPHOMORE YEAR—FALL TERM.

College Algebra -----	5
Physics (Mechanics) -----	5
History of Architecture (Arch. 2) -----	2
English Literature -----	3

AFTERNOONS.

Physical Laboratory $\frac{3}{4}$.	
Orders of Architecture (Arch. 12) $\frac{3}{4}$.	

WINTER TERM.

Analytical Geometry -----	5
Perspective (Arch. 13) -----	4
History of Architecture (Arch. 2) -----	3
Rhetoric -----	3

AFTERNOONS.

Orders of Architecture (Arch. 12) -----	4
Renaissance Design (Arch. 22) -----	6

MODIFIED DORIC ORDER



ORDERS OF ARCHITECTURE.

Royal S. Howlett.

SPRING TERM.

	<i>Hours per week.</i>
Calculus -----	5
Recent History -----	3
Architectural Composition (Arch. 3) -----	3
Rhetoric -----	3

AFTERNOONS.

Romanesque and Gothic Design (Arch. 23) -----	6
Renaissance Design (Arch. 22) -----	4

JUNIOR YEAR—FALL TERM.

Calculus -----	5
Sanitary Construction (Arch. 14) -----	2
Heating and Ventilation (Arch. 15) -----	3
Chemistry -----	5

AFTERNOONS.

Chemical Laboratory $\frac{3}{5}$.	
Drawing (Arch. 14 and 15) $\frac{2}{5}$.	

WINTER TERM.

Mechanics of Materials -----	5
Geology -----	3
Estimating (Arch. 17) -----	2
Chemistry -----	5

AFTERNOONS.

Chemical Laboratory $\frac{3}{5}$.	
Testing Materials $\frac{2}{5}$.	

SPRING TERM.

Trusses and Bridges -----	4
Specifications and Contracts (Arch. 18) -----	3
Planning and Requirements of Building (Arch. 4) -----	5
Superintendence (Arch. 19) -----	3

AFTERNOONS.

Design (Arch. 24) -----	10
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SENIOR YEAR—FALL TERM.

French (or German) -----	5
Composition of Ornament (Arch. 5) -----	7
Landscape Gardening $\frac{1}{2}$ -----	2
Thesis (Arch. 6) -----	1

AFTERNOONS.

Advanced Design (Arch. 25) -----	10
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WINTER TERM.

French (or German) -----	5
Pen and Ink Rendering (Arch. 26) -----	6
Architectural Engineering (Arch. 20) -----	4

AFTERNOONS.

Thesis (Arch. 27) -----	10
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CORINTHIAN DOORWAY



ORDERS OF ARCHITECTURE.
Royal S. Howlett.

SPRING TERM.

Hours per week.

French (or German) -----	5
Political Economy -----	4
Working Drawings (Arch. 16) -----	6

AFTERNOONS.

Thesis (Arch. 27) -----	10
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Supplemental to this course a series of lectures will be given before the classes by prominent architects, engineers and members of the Colorado Chapter of The American Institute of Architects upon the various phases of professional work.

GENERAL SUBJECTS.

The Department of Architecture draws upon the other departments of the College for instruction in all subjects of a literary, mathematical and technical nature, excepting those purely architectural. Thus, the students of architecture have the very great advantage of having their general work under a large number of teachers, each especially prepared and fitted for his particular line of work.

ARCHITECTURAL SUBJECTS.

Architecture is, of course, the major of all architectural students, and the courses offered are classified and briefly described as follows:

1. *History of Architecture*.—This is an elementary course given in the Fall Term of the Freshman year, and acts as an introduction for the new student to the whole subject of architecture and prepares him for Course 2.

2. *History of Architecture*.—This course covers thoroughly the whole field of the subject (which is briefly studied in Course 1). Beginning with the earliest Egyptian Architecture, each style is studied in turn down to modern work in our own country. Instruction is given by recitation and illustrated lectures during the Fall and Winter terms of the Sophomore year.

3. *Architectural Composition*.—This is the study of the theory of planning and designing. A great many examples both good and bad are studied and criticised. This subject is given in the Spring term of the Sophomore year, coming early in the course, that the rules of proportion and grouping and the general laws of Design, may be applied in the courses in Design.

4. *Planning and Requirements of Buildings*.—Under this subject are studied the essential requirements to be observed in the planning of public and semi-public buildings, such as school houses, churches, theaters, etc. Spring term. Junior year; lectures and drawing.

5. *Composition of Ornament*.—A study of the origin, evolution and use of ornament. Lectures and drawing. Fall term, Senior year.

6. *Thesis*.—One hour a week is given in the Fall term of the Senior year for the use of students in collecting material for their Thesis.

11. *Construction*.—The materials of construction and methods employed in their use are studied during the three terms of the Freshman year. Recitations and lectures are supplemented by work in the drawing room.

12. *Orders of Architecture*.—The five orders of Architecture are studied thoroughly in the Fall and Winter terms of the Sophomore year. The methods of casting shadows and finding shades are taught in making these plates. Lectures and draughting.

13. *Perspective*.—The theory of perspective and its application to architectural drawings is taught in the Winter term of the Sophomore year by lectures, recitations, and the making of drawings.

14. *Sanitary Construction*.—In the Fall term of the Junior year the methods of connecting buildings to water, gas, electric supplies and with drains and sewers, and other problems of sanitation are studied by lectures, recitations and making drawings of valves, traps, switchboards, etc.

15. *Heating and Ventilation of Buildings*.—Heating by means of hot air, water, steam, electricity, etc., are studied. Composition of fuels, ways of installing the different systems and approved methods of ventilation are thoroughly investigated. Lectures, recitations and drawing. Fall term, Junior year.

16. *Working Drawings*.—This course is introduced in the last term of the Senior year, that the graduate may be of immediate use to his future employer.

17. *Estimating*.—The different ways of estimating the cost of buildings to be built are investigated in the Winter term of the Junior year.

18. *Specifications and Contracts*.—Not only are these subjects carefully investigated, but Building Laws and Ordinances are taken up and studied. Lectures and recitations, Spring term, Junior year.

19. *Superintendence*.—The various methods of inspection of materials and workmanship form a course in the Spring term of the Junior year. Lectures and recitations.

20. *Architectural Engineering*.—In the Winter term of the Senior year the students do advanced work in construction. The problems arising in the designing of the modern sky scraper are carefully studied.

21. *Elementary Design*.—This course is introduced in the Fall term of the Freshman year. The problems are of small, inexpensive buildings, mostly of a domestic nature, the object being to get the student started to thinking about architectural problems by solving simple ones.

22. *Renaissance Design*.—In the Winter and Spring terms of the Sophomore year following the work in Orders, is a course calling for the solution of the simpler problems which may be satisfactorily treated in the Renaissance style.

23. *Romanesque and Gothic Design*.—In the Spring term of the Sophomore year designing in Mediaeval styles is begun. The arch and vault already studied in Masonry Construction and History of Architecture are here more thoroughly investigated.

24. *Design*.—In the Spring term of the Junior year a series of public buildings are designed in the styles which seem best adapted to the problem.

25. *Advanced Design*.—Fall term of the Senior year. Under this subject extensive establishments of various kinds are worked up, the student being given considerable freedom in choice of problems.

26. *Pen and Ink Drawing*.—The object of this course is to enable the student to make perspective sketches of proposed work with pen and ink and other mediums.

27. *Thesis*.—A Thesis is required of all graduates. The student shall choose his problem, subject to the approval of the instructor, who shall be the judge of the drawings necessary to the solution. The afternoons of the Winter and Spring terms of the Senior year are reserved for thesis work.

The entrance requirements for this course are identical with those of the other courses offered by the College which lead to the degree B. S.

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UNIVERSITY OF CALIFORNIA